HANFORD ENVIRONMENTAL RESTORATION PROJECT

SUBCONTRACT NO. 0100N-SC-G0058

EXHIBIT "D"

SCOPE OF WORK

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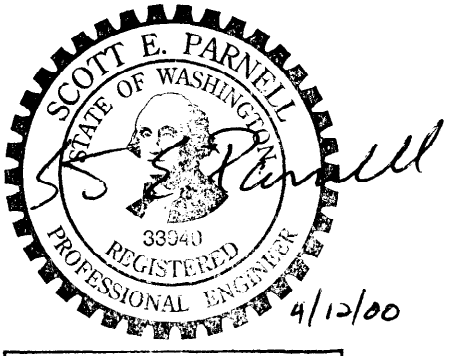
FOR

REMEDIAL ACTION FOR THE 100-N AREA
100-NR-1 TSD SITES



EXPIRES: 3/20/02

BHI-DIS 4/19/2000 SEP

REV.	DATE	REASON FOR REVISION	ORIGINATOR	CHECKER	GROUP SUPVR.	PROJ. ENGR./DES
1	4/13/00	Issued for Construction	SEP	KEC	JAG	FMC
0	12/06/99	Issued for Bid	SEP	KEC	JAG	FMC

HANFORD

RICHLAND ENVIRONMENTAL RESTORATION PROJECT

JOB NO. 22192

*SCOPE OF WORK NO. 0100N-SW-G0058

SHEET 1 of 55

SCOPE OF WORK
REMEDIAL ACTION FOR THE 100 N AREA
100-NR-1 TSD SITES

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EXHIBIT "D"
SCOPE OF WORK
REMEDIAL ACTION FOR THE 100 N AREA
100-NR-1 TSD SITES

1.0 GENERAL

This work scope is for the remedial actions required at the 100 N Area. This work scope includes performing remedial activities and furnishing facilities, equipment, labor, materials (including 25 B-25 boxes), supplies, and tools necessary to excavate, remove, load, and transport contaminated soils, debris, materials, reinforced concrete structures, and associated underground piping systems resulting from past waste disposal practices at the waste sites. In addition, this work scope includes SUBCONTRACTOR engineering and technical services to prepare necessary shop drawings to detail field activities including but not limited to, as-built location of access roads, installed service utility lines, lay down areas, and pre-engineered structure submittals (survey tent), etc. The treatment, storage, and disposal (TSD) sites in the 100-NR-1 Operable Unit (OU), as referred to in this scope, are as follows:

- 116-N-3 (1325-N Crib, trench, by-pass, and associated pipelines and structures)
- 116-N-1 (1301-N Crib, trench, and associated pipelines and structures)
- UPR-100-N-31 Unplanned release from 116-N-1 Crib
- 120-N-1 (1324-NA Percolation Pond)
- 120-N-2 (1324-N Surface Impoundment)
- 100-N-58 (South Settling Pond)

In general, the SUBCONTRACTOR's work scope for these sites includes the following:

- Perform activities to remove uncontaminated/contaminated soil and reinforced concrete structures at 116-N-3 to the extents shown on the project drawings, load into containers, present containers for survey, haul to Container Transfer Facility, and stage for disposal.
- Perform activities to verify pipe locations at 116-N-3, remove pipe, support/protect active utilities, remove abandoned utilities/pipe, remove concrete structures along pipe to the extents shown on the project drawings, size reduce the pipelines and concrete structures, load into containers, present containers for survey, haul to Container Transfer Facility, and stage for disposal. Pipeline material within the limits of excavation may be uncontaminated or

contaminated. All overburden material is subject to initial field screening and final verification as uncontaminated by the CONTRACTOR.

- Perform activities to remove and dispose of fencing and surface debris at 116-N-3.

- Perform activities to remove uncontaminated/contaminated soil and reinforced concrete structures at 116-N-1 crib and trench and UPR-100-N-31 to the extents shown on the project drawings, load into containers, present for survey, haul to Container Transfer Facility, and stage for disposal. Information for bidding 116-N-1 and UPR-100-N-31 is found in Attachment A. Issued for Construction Drawings (IFC) will be provided prior to 116-N-1 and UPR-100-N-31 site remediation.

- Perform activities to verify pipe locations at 116-N-1, remove pipe, support/protect active utilities, remove abandoned utilities/pipe, remove concrete structures along pipe to the extents shown on the project drawings, size reduce the pipelines and concrete structures, load into containers, present for survey, haul to Container Transfer Facility, and stage for disposal. The following major structures shall be removed and disposed with the pipeline: 1315-N valve pit, 1322-N, 1322-NA, 1322-NC, and 1914-N. Pipeline material within the limits of excavation may be uncontaminated or contaminated. All overburden material is subject to initial field screening and final verification as uncontaminated by the CONTRACTOR. Information for bidding 116-N-1 pipe is found in Attachment A. IFC Drawings will be provided prior to 116-N-1 site remediation.

- Perform activities to remove and dispose of fencing and surface debris at 116-N-1.

- Perform activities to transport containers to and from Container Transfer Facility and stage (prepare containers for transport) for disposal. Transportation of containers/materials from Container Transfer Facility to Environmental Restoration Disposal Facility (ERDF) and disposal will be performed by others.

- Perform activities to decontaminate equipment, which has removable radioactive material, when the equipment will continue to be used on the project. When equipment is no longer needed for work, perform activities to decontaminate for radiological release equipment exposed to contaminated materials, or prepare for disposal equipment deemed by CONTRACTOR impractical for decontamination to acceptable levels in accordance with 10 CFR 835 and DOE 5400.5. Decontamination may take an extended period of time.

- Perform activities to remove standing water from 120-N-2 and dispose as uncontaminated, as directed by the CONTRACTOR.

- Perform activities to remove Hypalon™ liner and leak detection system at 120-N-2 and dispose as uncontaminated material, remove piping associated with 120-N-1 and 120-N-2 from the basins to valve pit #1. Remove sampling shed, security fence, and pipe and dispose as uncontaminated material in an approved onsite inert landfill within 17 km of the site.

- Pipeline from valve pit #1 to the 163-N facility will be sampled by CONTRACTOR. If the pipe is found to be contaminated, perform activities to remove piping from valve pit #1 to within 1.5 m of the 163-N facility and cap pipe end. If the pipe is found to be uncontaminated, expose pipe 1.5 m from the 163-N facility, cap the upstream end, and fill with grout.

- Perform activities to remove and containerize for disposal asbestos material, as required by the Subcontract Documents.

The SUBCONTRACTOR has the responsibility to ensure that site configurations and interferences are planned for under the given Scope of Work. The SUBCONTRACTOR shall consider constraints inherent to a radiological environment when planning and executing the work. The SUBCONTRACTOR shall anticipate and be prepared to perform work operations using different levels of personnel protection (D, C, and B from 29 CFR 1910) based on the SUBCONTRACTOR'S means and methods as part of this Scope of Work.

The reactor effluent pipeline at 116-N-1 and 116- N-3 transported radionuclide, metal, and chemical contaminants. Scaling and residue buildup on the inside of the pipeline is expected, and the potential for airborne contamination exists. Pipeline stockpiling is limited to CONTRACTOR-approved surface storage areas within the area of contamination (AOC).

Any water encountered during excavation and materials handling of pipelines, toughs, or laterals may be integrated into the soil matrix for disposal.

Any material requiring stockpiling based on SUBCONTRACTOR'S means and methods shall be either stockpiled within AOC or at a materials staging area. Materials stockpiled outside the AOC shall be within a materials staging area.

Fencing removed to facilitate operations shall be replaced with temporary fencing or other CONTRACTOR-approved methods.

The SUBCONTRACTOR shall be responsible for the protection of all existing utilities during remedial action activities. SUBCONTRACTOR shall verify field location and depth of all utilities prior to any excavation activities. CONTRACTOR will perform ground penetrating radar and share results with the SUBCONTRACTOR. The SUBCONTRACTOR shall be responsible for verification of all information provided by CONTRACTOR. SUBCONTRACTOR shall verify systems are de-energized prior to removal. Methods of protection shall be submitted for CONTRACTOR approval prior to excavation activities.

The DN300 steel export water line, which crosses the 116-N-3 Trench just north of the first dam, will be supported with a temporary supporting structure constructed by others prior to remedial action. The SUBCONTRACTOR shall protect the export pipeline and steel support structure during excavation and backfill activities. SUBCONTRACTOR shall backfill below and around the pipe then remove the pipe support structure. The support will be 24.4 m long and consists of two parallel I beams with interconnecting L shaped bracing. The weight of the structure will not

exceed 13.6 t. The support is available for re-use to support the DN300 steel export water line where it crosses the effluent pipeline corridor just to the east of the 116-N-1 Crib. The export water line at the 116-N-1 crossing is constructed of carbon steel and was installed in the 1950s. The export water line carries raw water from the Columbia River. If used, the SUBCONTRACTOR shall construct concrete footings to support the steel beam at a sufficient height to allow for excavation activities.

The SUBCONTRACTOR is responsible for protection of existing extraction, injection, and monitoring wells within project limits. SUBCONTRACTOR is responsible for any damage to permanent casing, damage to the protective foundation, or breakage of well seal caused by the SUBCONTRACTOR. Replacement or repairs due to damage by SUBCONTRACTOR shall be performed by the CONTRACTOR at the SUBCONTRACTOR'S expense. Additional wells not shown on the Project Drawings may be encountered during excavation. Should such a well be encountered SUBCONTRACTOR shall immediately notify the CONTRACTOR and avoid further damage to the well.

1.1 ABBREVIATIONS

ANSI	American National Standards Institute
AOC	area of contamination
Anti-Cs	anti-contamination clothing
ALARA	As Low As Reasonably Achievable
CFR	*Code of Federal Regulations*
DN	diameter nominal
ERDF	Environmental Restoration Disposal Facility
HASP	Health and Safety Plan
HGET	Hanford General Employee Training
HRA	high radiation area
HSRCM	Hanford Site RadCon Manual
IFC	Issued for Construction
MAQDSR	Monthly Air Quality Data Summary Record
OSHA	Occupational Safety and Health Administration
OU	operable unit
PPE	personal protective equipment
PVC	polyvinyl chloride
RA	Radiation Areas
RCT	radiological control technician
RL	U.S. Department of Energy, Richland Operations Office
TSD	treatment, storage and disposal
WAC	*Washington Administrative Code*

2.0 WORK INCLUDED

The work includes the furnishing of labor, materials, equipment*, tools, facilities, supplies and necessary articles, and performance of operations and incidentals for excavation, demolition, removal, handling, containerization, associated transportation, and storage of contaminated and uncontaminated material in accordance with the Subcontract Documents.

*Except for ERDF waste disposal containers.

Specific activities include, but are not limited to, the following:

- Mobilization
- Radiological as low as reasonably achievable (ALARA) practices, including but not limited to, dose mitigation methods
- Excavation and material handling
- Demolition
- Demobilization.

2.1 MOBILIZATION ACTIVITIES

2.1.1 Training and Medical Requirements

The SUBCONTRACTOR safety and health requirements (Exhibits "B" and "G") provide specific instructions for the SUBCONTRACTOR in areas where there are CONTRACTOR requirements in addition to regulatory requirements, or where emphasis is needed in portions of the regulations to ensure uniformity between the SUBCONTRACTOR'S program and those of the CONTRACTOR'S operations and/or operations of other site contractors.

The SUBCONTRACTOR must demonstrate through properly documented records that personnel performing work on site have completed the appropriate training and medical requirements herein and in the subcontract documents before commencement of work. Advance notice is required for training and seating may be limited. Records shall be maintained by SUBCONTRACTOR in accordance with Subcontract Document requirements and available on site for CONTRACTOR review.

SUBCONTRACTOR site personnel must attend the following site-specific training (outlined in Exhibit "G") to be furnished by the CONTRACTOR. Note that the site-specific training must be U.S Department of Energy, Richland Operations Office (RL) approved to be considered valid.

Personnel who have the potential to enter or create a hazardous waste/radiological area must be in compliance with the training requirements specified in 29 CFR 1910.120 and 10 CFR 835. Work performed outside of hazardous or radiological areas may require additional training. Site-specific training and/or training applicable to specific tasks specified in the SUBCONTRACTOR'S health and safety plan (HASP) may be required. Supervisors of

Hazardous Waste Workers require 40-hour hazardous worker training and 8-hour Supervisor training regardless if they enter a posted hazardous area or not.

Advance notice of one week is required for Hanford General Employee Training (HGET). Maximum seating for HGET training classes is five people per day if available. Advance notice is required for radiological whole body counts.

2.1.2 Mobilization and Setup

Mobilization shall include delivery of equipment, tools, materials, supplies, facilities, setup, and sufficient work force required to perform the work specified in this Subcontract.

SUBCONTRACTOR shall supply 25 new B-25 boxes to be filled at CONTRACTOR'S discretion.

The SUBCONTRACTOR shall provide the CONTRACTOR, before delivery, a listing of equipment. The SUBCONTRACTOR shall update the equipment listing when additional equipment is brought on or removed from site. SUBCONTRACTOR shall submit certification that equipment delivered to the site is OSHA compliant and uncontaminated. Equipment brought to the site shall be in good working condition and free of any residual dirt, oil, or grease. Equipment glass shall be free of cracks. All toxic or hazardous substances, regardless of quantity, shall be reported in accordance with the requirements of the "Hazard Communication Program" described in Exhibit "G".

The SUBCONTRACTOR shall present equipment to be used in radiological areas to the CONTRACTOR for an initial radiological survey prior to being used within radiological areas.

The SUBCONTRACTOR shall submit a chemical management plan for CONTRACTOR approval in accordance with Chemical Management System requirements of Exhibit "G".

The SUBCONTRACTOR shall submit for approval by CONTRACTOR proposed area(s) for delivery and staging of equipment as part of Site Layout Plan shop drawing. The SUBCONTRACTOR is responsible for site preparation (i.e., stripping of vegetation, leveling, and security/access control requirements).

The CONTRACTOR reserves the right to inspect the equipment and its setup for safe operation at any time. The SUBCONTRACTOR shall correct safety deficiencies before operations begin and throughout the project duration.

SUBCONTRACTOR shall assemble/construct two (2) CONTRACTOR provided survey booths large enough to accommodate two people each. SUBCONTRACTOR is responsible for locating/relocating and maintaining the survey booths based upon SUBCONTRACTOR'S radiological access control plans. The maximum weight of the survey booth is estimated to be 13.6 t.

2.1.3 SUBCONTRACTOR-Provided Support Facilities

Before the commencement of remedial action operations, as a minimum, the SUBCONTRACTOR shall furnish and establish the following:

- Survey Station
- Exclusion Fence
- Decontamination Pad
- Container Transfer Facility
- Haul/construction roads and storage areas for soils and materials
- Separate portable toilets for men and women in accordance with applicable Occupational Safety and Health Administration (OSHA) regulations
- Change trailer (3 m x 12 m) for personal protective equipment (PPE) with gender specific changing areas
- SUBCONTRACTOR conference trailer (7 m x 18 m) with four offices for CONTRACTOR personnel.
- CONTRACTOR Access Station (2.4 m x 2.4 m)
- Trash receptacles/dumpsters
- Task lighting of container transfer facility
- Water fill station(s) and/or fill capabilities, as necessary
- Drinking and wash water facilities (table, cups, dispenser, liquid soap and dispenser, towels, trash receptacle and water) for site workers
- Procedures for sanitizing potable and wash water containers and tamper proof seals on container lids

Upon delivery, the SUBCONTRACTOR shall make field service connections to the SUBCONTRACTOR-supplied facilities. The CONTRACTOR reserves the right to inspect the facilities at any time. The SUBCONTRACTOR shall correct deficiencies to supplied facilities throughout the project duration.

The SUBCONTRACTOR shall also supply facilities (office, changing facilities, septic/portalet, etc.) needed for their personnel and radiological control technicians (RCTs) and make field service connections to the facilities from power panels shown on project drawings. The SUBCONTRACTOR shall submit verification that factory-built structures comply with *Washington Administrative Code* (WAC) 296-150F and commercial coaches comply with WAC 296-150C. Factory-built structures and commercial coaches shall meet tie-down requirements from applied wind loads and be skirted. Septic holding tanks, if necessary, shall meet the requirements of WAC 246-272. Roll-away septic holding tanks are considered an approved equal. The SUBCONTRACTOR is responsible for acquiring required permits.

Crushed surfacing for base course used at the Container Transfer Facility shall be obtained from stockpile at ERDF. SUBCONTRACTOR is required to obtain all base course material during site mobilization. CONTRACTOR will not guarantee the availability of material after site mobilization. SUBCONTRACTOR shall load and transport base course from ERDF to site.

Crushed surfacing for top course used for the Work shall be obtained from SUBCONTRACTOR sources.

2.1.4 Work Zone Delineation and Traffic Control

The SUBCONTRACTOR shall supply material, equipment, and personnel required for the demarcation and maintenance of construction and radiological control areas, as described herein, Exhibit "B," and Technical Specifications of the Subcontract. The CONTRACTOR will provide radiological posting (signs, labels, and rope/chains) for SUBCONTRACTOR installation.

The SUBCONTRACTOR shall post and maintain radiological work areas in accordance with the Exhibit "E," Technical Specifications. Equipment and personnel will be subject to radiological survey (and possible decontamination) when transferred from a radiological area. The extent of surveying and decontamination will be determined by the CONTRACTOR, based on radiological conditions and the extent of radiological control.

Not all soils, structures, pipes, and associated materials have been characterized to meet release criteria/standards; therefore, the SUBCONTRACTOR shall anticipate delays consistent with the nature and performance of a radiological environment during the excavation/remediation/ demolition of waste sites. Delays inherent to excavation and removal include analytical sampling and radiological surveying (frequency specific to area) of newly exposed surfaces (uncontaminated or contaminated) and dose control techniques. Coordination between the SUBCONTRACTOR and the CONTRACTOR will be required to minimize/eliminate the impact of analytical sampling and radiological surveying activities on remedial operations.

SUBCONTRACTOR shall provide, install, and maintain a CONTRACTOR's access station. SUBCONTRACTOR shall provide personnel to occupy the station during periods of operation.

SUBCONTRACTOR shall provide, install, and maintain signs, access control gates in accordance with Subcontract Documents. SUBCONTRACTOR shall install additional signs as directed by CONTRACTOR.

The SUBCONTRACTOR shall prepare and submit a Traffic/Access Control Plan describing how traffic and personnel will be directed, including speed limits and signage, to facilitate cleanup efforts and avoid accidents, for CONTRACTOR review. The Plan shall also describe how the SUBCONTRACTOR shall maintain access control (allowing only authorized personnel into site boundaries), where fencing (permanent or temporary) and gates will be installed, when gates will be locked, and how gates will be controlled when unlocked. The CONTRACTOR will administratively control all access to High Radiation Areas (HRA) in accordance with Hanford Site RadCon Manual (HSRCM) and 10 CFR 835 requirements. Traffic corridors shall be distinguished in accordance with the approved SUBCONTRACTOR Traffic/Access Control Plan.

2.1.5 ALARA Plan

SUBCONTRACTOR shall submit an ALARA plan describing at a minimum how dose limits will be achieved, individual dose estimates, and dose tracking methods.

2.1.6 Air Monitoring Requirements

SUBCONTRACTOR shall be responsible for inspection of a maximum of six (6) CONTRACTOR-supplied portable air monitors in the areas around the perimeter of the excavation, 4 of the 6 monitors are shown on the project drawings. The location of the other 2 monitors is yet to be determined. SUBCONTRACTOR shall inspect these monitors until excavations are complete, the soil (exposed surfaces) has been stabilized and regulator approval for monitor shutdown is received. The inspection of air monitors shall be coordinated with the CONTRACTOR. Air monitors must be operational 24 hours a day, including weekends and holidays, for the duration of this Subcontract. The SUBCONTRACTOR shall inspect the air monitors daily, except non-working holidays and weekends, to ensure the monitors are operating, and record the status on a Monthly Air Quality Data Summary Record (MAQDSR) and submit to the CONTRACTOR every month. Any interruption of operation and resulting action taken shall be recorded on the MAQDSR and the CONTRACTOR shall be immediately notified. If more than one air monitor is shut down for more than 48 hours during normal work operations, excavation operations shall be suspended until the units are returned to service.

2.1.7 Readiness Assessment

Before granting a Notice to Proceed for excavation, the SUBCONTRACTOR shall participate in a readiness assessment to demonstrate to the CONTRACTOR that its personnel, procedures, and equipment are ready to commence work. The SUBCONTRACTOR shall be expected to participate in ongoing status meetings 2 times per week, averaging 3 hours per meeting. These meetings will take place from the time of Subcontract award until Notice to Proceed for excavation activities. The following SUBCONTRACTOR personnel shall attend: Project Manager, Site Superintendent, Safety, and RadCon. The SUBCONTRACTOR shall perform dry runs of various operational scenarios, over a period not to exceed 5 - 10 working days, on operations, including, but not limited to, loading and handling of containers with uncontaminated soils to simulate contaminated soils or materials. The expectation of the dry runs is to demonstrate that the proposed operations, procedures, personnel, equipment, and facilities meet the performance requirements of this Subcontract. Any deficiencies noted during these dry run operations shall be corrected, at no additional cost to the CONTRACTOR, before the CONTRACTOR will issue the Notice to Proceed for excavation operations.

2.2 GROUTING

SUBCONTRACTOR shall drill a minimum of eleven 125 mm diameter holes through the 116-N-3 Crib cover panels. SUBCONTRACTOR may request relief for additional holes based on means and methods, and ALARA practices. Drill one hole over each lateral without access hatches, and one hole over the main trough at locations shown on the project drawings.

SUBCONTRACTOR shall be responsible for final location of holes. SUBCONTRACTOR shall cut a slot in the influent pipe and install a steel plate to prevent grout from flowing into the pipe. When holes are drilled and grout barrier is in place, SUBCONTRACTOR shall begin placing grout in the main trough first and then place grout into laterals to the depths specified.

2.3 EXCAVATION AND MATERIAL HANDLING

Excavation and material handling shall be performed in accordance with the following requirements.

2.3.1 Civil Surveying Requirements

Locations and survey points/coordinates identified on the project drawing are for reference only. The SUBCONTRACTOR shall field verify survey control points and temporary survey monuments. The accuracy of survey points is the responsibility of the SUBCONTRACTOR and shall meet the standards in Exhibit "E," Technical Specifications.

SUBCONTRACTOR shall submit an electronic and hard copy of survey drawings to CONTRACTOR within 10 working days following completion of each survey, as required by Exhibit "E," Technical Specifications.

The SUBCONTRACTOR shall survey the physical dimensions and topography of each waste site, and associated piping systems at frequencies defined below.

Survey Requirements:

- 116-N-3 Crib and Trench – survey required at pre-excavation (from edge of crib and trench to fence) and at post-excavation.
- 116-N-3 Pipelines – survey required at pre-excavation and post-excavation.
- 116-N-1 Crib and Trench – survey required at post-excavation.
- 116-N-1 Pipelines – survey required at pre-excavation and post-excavation
- UPR-100-N-31 – survey required at pre-excavation and post-excavation
- 120-N-1 and 120-N-2 - survey required at post-excavation.
- 100-N-58 - no survey required.

Contamination found beyond the limits of excavation will require a pre-excavation and post-excavation survey.

If the backfill option is exercised, a post backfill survey and drawing will be required.

2.3.2 Housekeeping Requirements

The SUBCONTRACTOR shall perform housekeeping for all SUBCONTRACTOR provided facilities, as required, to keep the site free of miscellaneous litter, trash, and debris. The SUBCONTRACTOR shall conduct routine, daily cleaning required to keep the SUBCONTRACTOR-controlled/operated or occupied support facilities, site grounds, roads, and waste sites free of trash, litter, food, tumbleweeds, and dust. The SUBCONTRACTOR shall provide an adequate supply of trash receptacles/dumpsters at the site and shall be responsible for verification that appropriate material (nonhazardous, nonradioactive) is accumulated for SUBCONTRACTOR offsite disposal. Housekeeping shall also include, but not be limited to, providing supplies and materials for drinking water, toilet facilities, and wash stations.

2.3.3 Radiological Controls

The SUBCONTRACTOR shall ensure that all of its workers maintain strict compliance with radiation work permits, area postings, ALARA requirements, frisking and personnel monitoring requirements, and HRA entry requirements. The SUBCONTRACTOR shall be held responsible for strict compliance with all radiological control requirements during the performance of the work.

The 116-N-3 crib and trench are posted as a Contamination Area (CA) and a Radiation Area (RA). The uncontaminated portion of the trench is expected to be downposted to SCA (Soil Contamination Area) prior to the start of remediation.

Radiation exposure to SUBCONTRACTOR personnel working in Radiation Areas (RA) and HRA will be monitored on a daily basis. The daily monitoring will be used to make projections for the project and will be used to indicate whether adjustments will need to be made to keep personnel exposures ALARA. No individual may receive a dose in excess of 500 mrem per calendar year. Substitutions of employees to meet this limitation are not acceptable. Individual task operations (e.g., excavation, transport, queue operations, etc.) must also be limited to less than 500 mrem per calendar year.

The SUBCONTRACTOR shall be required to team with the CONTRACTOR on the final planning for methods to reduce personnel exposure to ionizing radiation. This final planning will occur after the award of the contract and before the beginning of excavation. The SUBCONTRACTOR will provide to the CONTRACTOR, as part of the ALARA plan, the exposure estimates by task and the steps the SUBCONTRACTOR has taken to minimize personnel exposure. In addition, the SUBCONTRACTOR will be expected to track the radiation exposure of SUBCONTRACTOR personnel based on information provided by the CONTRACTOR.

The containers shall be loaded with contaminated material such that the exterior radiation levels of the container cannot exceed 50 mrem/hr on contact. Blending of clean and contaminated materials is not allowed for waste acceptance, which includes a 50 mR/hr on contact, exterior radiation level for containers. High and low activity soils (including cobbles and boulders) and

demolition debris is expected to be mixed as a result of normal excavation, demolition, and loading activities.

2.3.4 Excavation

2.3.4.1 General

CONTRACTOR approval and Notice to Proceed will be required before demolition and/or excavation. Radiological support, to be provided by others, is required for all Work at 116-N-3 and 116-N-1.

Site preparation, including stripping of the waste site area, construction of haul roads, and Container Transfer Facility, shall be the responsibility of the SUBCONTRACTOR within the boundaries of the site and/or applicable specifications. Uncontaminated soil and organic materials collected as part of the stripping operation shall be stockpiled separately for later use as backfill material. CONTRACTOR will require random access for surveying of material placed into the bucket prior to placement into containers. SUBCONTRACTOR may be required to place material back into trench or crib excavation to facilitate acceptable contact dose rates.

Any material staged outside the area of contamination (AOC) shall be placed within a Material Staging Area. The SUBCONTRACTOR shall be responsible for the construction, daily inspection, and maintenance of all material staging areas.

The SUBCONTRACTOR shall excavate and stockpile uncontaminated material and remove, load, and transport contaminated materials including, but not limited to, soil, reinforced concrete and steel structures, cast iron, steel, and reinforced concrete pipelines. Certified training is required for personnel involved with removal, containerization, and packaging of asbestos containing material. Contaminated soil shall be excavated to the limits shown on the project drawings. Contamination of soil and other materials will be determined with analytical sampling and in-progress radiological surveying of newly exposed surfaces. The frequency of radiological surveying is specific to each area and will be determined by the CONTRACTOR.

The SUBCONTRACTOR shall remove, load, and stage for transport to ERDF, miscellaneous waste in and around the 116-N-1 Trench and the 116-N-3 Crib and Trench. The miscellaneous waste consists of 3 waste boxes (1.2m x 1.2m x 2.4 m) filled with mulberry bushes located on the north side of the 116-N-3 Crib; 3 waste boxes and 10 – 55 gallon drums of soil in the 116-N-3 Trench; 3 waste boxes and 10 – 55 gallon drums of soil in the 116-N-1 Trench, along with multiple bags of PPE in each Trench.

The SUBCONTRACTOR shall remove, size, load, and stage for transport to ERDF, steel casing (piping), miscellaneous tubing, and wiring located in the area of excavation as a result of well decommissioning activities at 116-N-1 and 116-N-3. Approximately 19 m of casing ranging from DN 200 to DN 250 is present at the 116-N-3 Crib and

approximately 45 m of casing ranging from DN 200 to DN 400 is present at the 116-N-1 Crib.

The SUBCONTRACTOR shall remove and stage the uncontaminated 55 gallon steel drums randomly placed on the 116-N-3 Trench covers at CONTRACTOR designated area. Drums will be disposed of by CONTRACTOR.

SUBCONTRACTOR shall provide safe access for excavation operations, including pipe cutting and pipe removal (i.e., pipe joint cutting), sampling efforts, radiological monitoring/surveying, and civil surveying.

The excavation bottom elevation, as shown on the project drawings, is the expected maximum depth to be excavated. It is expected that actual waste site and/or site pipeline orientation and locations may vary from the excavation limits shown on the project drawings. Therefore, the CONTRACTOR reserves the right to alter the shape of any excavation up to the subcontract quantities. The SUBCONTRACTOR shall excavate to revised limits, as directed by the CONTRACTOR, should the CONTRACTOR choose to exercise this right. SUBCONTRACTOR shall determine means to control excavation limits. No cost or schedule compensation will be made for SUBCONTRACTOR'S inadvertent and/or unauthorized excavation beyond the specified excavation limits.

SUBCONTRACTOR shall ensure any HRA is fenced with locked or guarded gates at all times. The CONTRACTOR will administratively control all access to the HRA. The SUBCONTRACTOR shall secure access to open excavations by placing exclusion fencing across any unsecured access points. Excavations will remain open at the end of this Subcontract, unless the backfill option is exercised.

The SUBCONTRACTOR shall be responsible for services including labor, equipment, tools, and material required to protect or re-route active utility lines. The SUBCONTRACTOR shall coordinate any utility protection and re-routing with the CONTRACTOR.

2.3.4.2 Demolition and Removal of Structures

2.3.4.2.1 Contaminated

Contaminated structures and underground pipelines shall be reduced to appropriate sizes, as defined in the specifications, before being loaded and transported to the Container Transfer Facility, as required. Contaminated structures include, but are not limited to, crib and trench reinforced concrete walls, cover panels, foundations, girders, distribution troughs, underground pipelines, reinforced concrete bypass structure, wooden poles, and reinforced concrete structures (boxes, anchors, supports, encasements) associated with the piping systems.

The cover panels and associated foundations and sidewalls shall be demolished in place for the 116-N-3 Trench from dam #1 to the crib and for the entire length of the 116-N-1 Trench. The side walls, troughs, and distribution laterals for the 116-N-3 Crib shall be size reduced in place. The girders shall be removed and placed in a size reduction area. SUBCONTRACTOR shall wet and apply a crusting agent, fixative, or grout to the soils beneath each panel prior to demolishing.

The cover panels for the 116-N-3 Crib shall be removed in one piece (intact) and placed in a size reduction area(s). All materials shall be reduced in accordance with the ERDF WAC and Supplemental Waste Acceptance Criteria. After all size reduction activities are completed, SUBCONTRACTOR shall remove the size reduction area(s), load into ERDF containers, haul to the container transfer facility, and stage for disposal.

Any cross contamination of adjacent soils during size reduction activities shall be remediated by SUBCONTRACTOR at no additional cost to the CONTRACTOR.

SUBCONTRACTOR shall submit a plan detailing the location, design, construction, and operating methods for the size reduction area(s).

2.3.4.2.2 Uncontaminated

Uncontaminated structures shall be sized for ease of loading and hauling and disposed of on-site in a CONTRACTOR approved inert landfill within 17 km of site or demolished in place and used for backfill. SUBCONTRACTOR is encouraged to apply techniques that will achieve waste minimization or recycling. Uncontaminated structures include, but are not limited to, 116-N-3 Trench cover panels from dam #1 to end of trench, security fence (including posts and sub-surface supports) around 116-N-3 and 116-N-1, 120-N-2 Hypalon™ liner and leachate collection system, polyvinyl chloride (PVC) pipe associated with 120-N-1 and 120-N-2, fencing (including posts and sub-surface supports) at 120-N-1 and 120-N-2, and the sampling shed.

SUBCONTRACTOR shall load, haul, and dispose of the security fence around 116-N-3 and 116-N-1; Hypalon™ liner and leachate collection system; PVC pipe associated with 120-N-1 and 120-N-2; fencing (including posts and sub-surface supports) at 120-N-1 and 120-N-2; and the sampling shed at a CONTRACTOR approved inert landfill.

SUBCONTRACTOR shall demolish the uncontaminated trench cover panels from dam #1 to the end of the trench at 116-N-3 in place and use as backfill. SUBCONTRACTOR shall remove a maximum of six cover panels between

dam #1 and the end of the trench. Each panel shall be removed in one piece to allow for sampling. SUBCONTRACTOR shall provide safe access to the bottom of the panels for sampling.

2.3.4.3 Surface Drainage, Erosion, and Dust Control

The SUBCONTRACTOR shall develop a drainage plan for each waste site, associated piping, spoil area, etc., as part of the earthwork plan. Surface water shall be directed away from the excavation and construction sites to prevent ponding and erosion. Diversion ditches, dikes, and grading shall be provided and maintained during excavation activities to prevent erosion and sloughing of the slopes. The excavation shall be performed so that the areas immediately surrounding the site, and operations at the site, are continually and effectively drained.

The SUBCONTRACTOR shall provide dust suppression to control visible dust emissions within the limits of the construction area throughout the duration of the Subcontract. The SUBCONTRACTOR shall control dust emissions using water, fixatives, crusting agents, or other methods/material reviewed and approved by the CONTRACTOR. SUBCONTRACTOR shall minimize the amount of water used for dust control during excavation. The SUBCONTRACTOR shall establish a water fill station at a fire hydrant shown on the project drawings.

2.3.4.4 Vehicular Access and Maintenance of Onsite and Offsite Haul Roads

The SUBCONTRACTOR shall provide excavation access ramps where required. The SUBCONTRACTOR shall also construct and maintain haul roads, as necessary, for the performance of this Subcontract. Road maintenance includes, but is not limited to, removal of debris, filling of potholes, maintaining grades, dust control, and snow removal prior to the start of operations, and as required during each workday. Snow removal shall be performed for the entire width of haul and access roads from the main road to operational areas.

SUBCONTRACTOR shall ensure that existing vehicular access routes are maintained throughout the duration of the project.

The SUBCONTRACTOR'S vehicles shall stay within approved site boundaries. Maintenance on contaminated vehicles shall be performed within radiological control boundaries. Maintenance on uncontaminated vehicles shall be performed outside of radiological areas. Should the SUBCONTRACTOR'S means and methods, as allowed by the CONTRACTOR, require temporary rerouting of such vehicular access, the SUBCONTRACTOR shall be responsible for barricades, signs, and upgrading and maintaining detour site access roads, including additional grading, leveling, and increased turning radius.

2.3.4.5 Contamination, Dose Control, and Decontamination

The SUBCONTRACTOR shall excavate to minimize the potential spread of contamination and maintain dose ALARA. The SUBCONTRACTOR shall provide equipment and personnel necessary to decontaminate equipment and materials to ensure that they are free of radiological contamination as defined in Exhibit "E," Technical Specifications. Decontamination fluids shall be collected and work shall be performed in accordance with the SUBCONTRACTOR's decontamination work procedures, which will be reviewed and approved by the CONTRACTOR prior to commencing work. SUBCONTRACTOR decontamination work procedures shall conform to "Best Management Practices." CONTRACTOR cannot guarantee release of SUBCONTRACTOR equipment, and any such equipment becomes the property of the CONTRACTOR without any additional compensation to the SUBCONTRACTOR. Any equipment that cannot be decontaminated or free released in a timely manner will not be released back to the SUBCONTRACTOR unless the SUBCONTRACTOR is approved to own/control radioactive material.

2.3.4.6 Potential Subsurface Cultural Resources

Excavation activities will occur in areas of potential subsurface cultural resources. A CONTRACTOR Cultural Resource Specialist may be on site and occasionally may need to examine excavations and/or excavated materials. The CONTRACTOR will coordinate this need to avoid impacts to the SUBCONTRACTOR'S production. The CONTRACTOR's Cultural Resources Specialist will provide an awareness briefing, not to exceed one hour, to SUBCONTRACTOR personnel prior to commencement of remedial activities. If any cultural resources are encountered, Work in the vicinity of the discovery shall be suspended and the CONTRACTOR's onsite representative notified immediately. Should cultural resources be unearthed, excavation activities will be directed away from the immediate location of discovery while assessment and appropriate actions are taken by the CONTRACTOR.

The SUBCONTRACTOR shall install an exclusion fence along the boundary of the cultural exclusion area and limits of construction as shown on project Drawings and specified in Exhibit "E," Technical Specifications. SUBCONTRACTOR shall inspect exclusion fence daily, make repairs on same day, and record in daily log results of inspection, when inspection was performed, and any repairs which were made.

2.3.5 Support of CONTRACTOR Field Screening, Surveying, Sampling, and Testing

2.3.5.1 Radiological Controls and Support Requirements

In the process of excavation operations, the CONTRACTOR is required to systematically and intermittently conduct radiological surveys and sampling of the Work and construction equipment for contamination control and to ensure worker health and safety. The CONTRACTOR will communicate this need to the SUBCONTRACTOR and, if

necessary, direct the SUBCONTRACTOR to work away from the proposed survey and sampling area.

Due to space constraints or the need to survey working equipment, it will sometimes be necessary to direct the SUBCONTRACTOR to momentarily suspend excavation and/or container loading work during the radiological surveying or sampling operation.

The SUBCONTRACTOR shall provide safe access for CONTRACTOR sample technicians and RCTs to allow sampling and radiological surveys.

The SUBCONTRACTOR shall identify work activities that would require RCT involvement and schedule them through the CONTRACTOR. The SUBCONTRACTOR should anticipate rotations of RCT personnel at the site associated with a bargaining agreement and scheduled training. The CONTRACTOR will coordinate with the SUBCONTRACTOR to provide a workforce of RCTs to support the SUBCONTRACTOR'S schedule and accommodate reasonable adjustments (weekly progress schedule update) to the SUBCONTRACTOR'S scheduled work activities.

The SUBCONTRACTOR should anticipate delays and shutdowns due to environmental conditions such as high winds, atmospheric conditions that would create elevated levels of naturally occurring radionuclides (e.g. radon, this condition masks the instrumentation's ability to detect radioactivity) and extreme cold.

2.3.5.2 In-Process Waste Characterization Support Requirements

Characterization of the soils and other excavated materials will be carried out by the CONTRACTOR as the excavation progresses in support of waste characterization for disposal to ERDF. The CONTRACTOR will make every effort to avoid impacts to the SUBCONTRACTOR'S production.

The in-process waste characterization is separate from final site closeout sampling and testing performed by the CONTRACTOR at completion of the waste site or pipeline excavation. The SUBCONTRACTOR shall support soil sampling from the excavation, excavation equipment, excavated materials (containerized or not), and stockpiled material, as required, to obtain representative samples and/or field screening of the material.

The SUBCONTRACTOR shall allow up to 2 hours per week for work suspension of excavation and/or container loading to support these activities. This time allotment will be accumulative, if not utilized, and begins with the Notice to Proceed and continues throughout the duration of the project, for environmental surveying, sampling and field screening activities.

The SUBCONTRACTOR shall provide safe access for CONTRACTOR sample technicians and RCTs to allow sampling and field screening activities.

2.3.5.3 Site Closeout Support Requirements

The SUBCONTRACTOR shall provide safe access for CONTRACTOR sample technicians and RCTs to allow sampling and radiological surveys for site closeout purposes. The SUBCONTRACTOR shall allow soil sampling from the excavation, excavated materials (containerized or not), and stockpiled material, as required, to obtain representative samples of the material. Information from such sampling and surveying will be used by CONTRACTOR technical personnel for site closeout purposes. The SUBCONTRACTOR'S work sequencing shall be flexible to accommodate the CONTRACTOR'S sampling activities.

2.3.6 Trenching and Potholing

In order for the CONTRACTOR to assess contaminant distribution associated with effluent piping or waste sites, a series of potholes and/or trenches may be necessary prior to full-scale excavation. The activity shall be conducted periodically at the direction of the CONTRACTOR on an as-needed basis to define waste site or pipeline corridor contamination extent and/or obtain samples for waste profile development.

Potholes or trenches will provide a means for validating and establishing a profile of contamination, and verifying lateral extent of contamination. Potholes shall generally be over top of the pipe or waste site and trenches perpendicular to the pipe. In general, holes shall be immediately backfilled once they are no longer required.

The SUBCONTRACTOR'S method of operation shall be to dig potholes or trenches in locations directed by CONTRACTOR with appropriately sized equipment, depending on factors such as suspected pipe depth and availability of other information. The SUBCONTRACTOR shall work under the guidance of the CONTRACTOR to provide access to soil for screening or sampling as conditions warrant. CONTRACTOR screening requirements can range from discrete bucket scan to a sample collected approximately every meter vertically or horizontally.

2.3.7 Material Handling

Material removed from excavations shall be segregated as uncontaminated or contaminated. Material designated as uncontaminated shall be transported and temporarily stored by the SUBCONTRACTOR in the appropriate CONTRACTOR approved materials staging area or demolished in place. CONTRACTOR will perform confirmation sampling of these materials and verify that they are uncontaminated. Soils confirmed as uncontaminated will remain stockpiled for backfill operations, debris confirmed as uncontaminated shall be hauled to an approved inert landfill or demolished and left in place. The SUBCONTRACTOR is responsible for double handling if uncontaminated stockpiles are placed where contamination (plumes) extends beyond excavation limits.

Contaminated material shall be containerized in ERDF containers and transported by the SUBCONTRACTOR to the Container Transfer Facility. Contaminated material exceeding the

dimensions specified in Exhibit "E" (oversized) can be transported with CONTRACTOR approval. Oversized material may include, but is not limited to, trough sections. Oversized material shall be loaded onto SUBCONTRACTOR supplied tractors and trailers and transported by the SUBCONTRACTOR to the Container Transfer Facility. CONTRACTOR will provide labor to SUBCONTRACTOR for the sole use of transporting (round trip) oversized concrete structures to ERDF (20 km one-way). SUBCONTRACTOR shall coordinate with CONTRACTOR for CONTRACTOR supplied labor to drive SUBCONTRACTOR'S owned equipment to and from ERDF. The number of trips per day will be restricted to ERDF's ability to handle incoming debris based on size configuration and logistics set-up at ERDF for offloading. CONTRACTOR intends to support reasonable (level shipment rate) requests from SUBCONTRACTOR for the transport of material to ERDF. SUBCONTRACTOR shall supply, maintain, and assume all operational costs for a minimum of eight trailers and sufficient tractors for duration of hauling of oversized material. SUBCONTRACTOR'S tractor/trailer units used for handling of oversized materials shall be operated outside of the contamination area. CONTRACTOR can not guarantee timely return of tractor and trailer from ERDF.

SUBCONTRACTOR shall size reduce girders and crib cover panels in accordance with Subcontract requirements and transport in ERDF containers. The SUBCONTRACTOR shall be responsible for contamination control during size reduction activities.

SUBCONTRACTOR'S tractor/trailer units for handling distribution trough sections shall be a low boy type trailer with steel plated bed, capable of safely handling oversized material with minimum dimensions of 9.1 m long, 1.2 m wide, and a minimum 59 t payload. Distribution trough sections will be dragged off of lowboy during offloading at ERDF. SUBCONTRACTOR shall ensure that the selected equipment configuration is compatible with the CONTRACTOR'S means for removing large concrete configurations. SUBCONTRACTOR shall bear all costs of any damage to SUBCONTRACTOR'S equipment during off loading at ERDF.

The SUBCONTRACTOR shall supply labor and materials needed for procurement, handling, and installing preformed plastic liners into ERDF containers.

CONTRACTOR supplied roll-on/roll-off flats will not be used for transport of segmented concrete panels. The weight and configuration of the panels and the design of the roll-on/roll-off flats preclude safe shipment of segmented material.

2.3.8 Container Maintenance

The SUBCONTRACTOR is responsible for maintaining ERDF transport containers from time of delivery until receipt for pickup by others. Containers shall be protected and secured as necessary to prevent the intrusion of precipitation (i.e., water, ice, snow). SUBCONTRACTOR shall identify damage to containers which may affect containment of waste and report the damage to the CONTRACTOR.

The SUBCONTRACTOR is responsible for inspection and dewatering of containers (pumping or use of absorbent) with free-standing liquid in empty and full containers. Attention shall be

directed to containers awaiting pickup during periods of and after inclement weather. Liquids found to be free standing in containers either full or empty shall not be released for transport to ERDF and be considered contaminated (radioactive/chemical). Water shall be disposed of as directed by the CONTRACTOR if absorbent material is not used. CONTRACTOR will direct the SUBCONTRACTOR to transfer water into containers (at the decontamination pad or container location) or to a waste site, based on the circumstances and in accordance with approved SUBCONTRACTOR plans.

The SUBCONTRACTOR shall handle and furnish required maintenance on CONTRACTOR-supplied tarps installed on containers in the empty queue, unless specifically stated below:

- Tarp installation shall take place inside of the survey station
- Inspection of and adjusting tie-down cords on tarps
- Replacing worn/damaged tie-down cords (material provided by others)
- Inspection, removal, and replacement of failed or damaged tarps (material provided by others).

The tarping practice is intended to ensure timely return of empty usable containers to various Hanford Site locations and prevent the entrance of precipitation into full and empty containers staged in the Container Transfer Facility.

The SUBCONTRACTOR shall provide and apply a nonregulated lubricant (e.g., vegetable oil, calcium chloride, propylene glycol) to the inside of the CONTRACTOR-supplied containers from November through February, to ensure the release of plastic liners and contents from the containers during the dumping operation at ERDF.

2.3.9 Waste Shipping

Excavated contaminated material will be shipped to ERDF. The SUBCONTRACTOR shall supply information regarding the container identification, date of excavation, type of material, and point of origin of excavated material, in accordance with the Exhibit "E," Technical Specifications. The CONTRACTOR will supply a waste profile that identifies the material type, activity, and isotopic makeup of the material.

The SUBCONTRACTOR will be required to assist CONTRACTOR in preparation, collection, and placement of shipping papers on containers. Placement of the shipping papers on containers shall occur in the survey station. The SUBCONTRACTOR shall list on the waste shipping papers, at a minimum, a) container number, and b) any anomalous material not listed in the contents section of the shipping form. The SUBCONTRACTOR shall be aware of the different types of materials being loaded into containers and have knowledge of the general proportions of each material type to ensure that the description of the container contents listed on the shipping

form matches the contents of the container. The CONTRACTOR will provide waste shipping services.

The contaminated material is expected to be a state F listed waste (WAC 173-303-9904 F003) and will require that containers have placards in place prior to loading. The CONTRACTOR will supply placards for the SUBCONTRACTOR to place on containers.

Each container shall meet container weight restrictions and shipping requirements (valid waste profile) as specified in the Exhibit "E," Technical Specifications. The SUBCONTRACTOR is responsible for ensuring that material (including container) being shipped does not exceed the over-the-road weight restrictions. CONTRACTOR may impose weight-limiting controls on the ERDF transport vehicles. Any containers that exceed the weight limits controls will not be loaded and the SUBCONTRACTOR shall be responsible to offload material from the container to meet the weight restrictions.

The SUBCONTRACTOR shall be responsible for managing traffic and container inventory (full and empty) to maximize the turnaround of containers and to minimize unnecessary personnel radiation exposure and impacts to container loading and unloading during seasonal time periods.

The SUBCONTRACTOR shall manage full containers and limit activities near the full containers to minimize personnel radiological exposure.

2.3.10 Waste Minimization

The SUBCONTRACTOR shall handle the materials in a manner that minimizes the generation of additional waste and the occurrence of cross-contamination.

The CONTRACTOR will identify uncontaminated materials based on radiological surveys and/or chemical analysis. The SUBCONTRACTOR shall segregate uncontaminated material from contaminated material for waste minimization. This also includes, but is not limited to, laundry, tape, equipment, tools, and other miscellaneous materials/debris.

2.3.11 Personal Protective Equipment

The SUBCONTRACTOR shall provide and maintain PPE for the SUBCONTRACTOR personnel, RCTs, and samplers, as required, for the execution of the work scope.

The SUBCONTRACTOR shall consider constraints inherent to a radiological/chemical environment when planning and executing work logistics and work processes (means and methods). The SUBCONTRACTOR shall anticipate and be prepared to perform work operations using different levels of personal protection based on the SUBCONTRACTOR'S means and methods, radiological parameters identified, and specific radiological/chemical conditions prior to performing Work (identified on radiological work permit and health and safety plan). Personal protection levels of D, C, and B (29 CFR 1910) should be anticipated as part of the Scope of Work.

The SUBCONTRACTOR shall provide and maintain an inventory of anti-contamination clothing (Anti-Cs). The SUBCONTRACTOR shall provide the SUBCONTRACTOR personnel with Anti-Cs, as required, and provide additional 80 sets (minimum) per month for CONTRACTOR support personnel. The SUBCONTRACTOR shall be responsible for providing and maintaining a supply of flame-resistant Anti-Cs for personnel involved in torch-cutting activities. CONTRACTOR Anti-C size requirements will be provided to the SUBCONTRACTOR during project mobilization. Clean Anti-Cs shall be stored in an orderly manner, in a secure area, free of dust intrusion and pests (e.g., spiders), and clearly segregated by size. The SUBCONTRACTOR shall identify, tag, and immediately dispose of defective PPE.

The SUBCONTRACTOR is responsible for providing and maintaining respiratory protection of SUBCONTRACTOR employees for nonradioactive hazards based on the SUBCONTRACTOR'S means and methods, including an inventory of clean respiratory masks.

For Work performed within a radiological area that may require protection based on the potential for airborne radioactive contamination, the CONTRACTOR will provide respiratory protection. Should a combination of hazards be present with airborne radioactive contamination, the CONTRACTOR will coordinate with the SUBCONTRACTOR'S Safety Representative to determine the appropriate respiratory protection combination that the CONTRACTOR will provide.

2.4 BACKFILLING

Site closeout requirements and OWNER approval for backfill are expected to take several months; therefore, backfilling of waste sites will be an optional part of this Subcontract. If the CONTRACTOR exercises this option, the remediated sites will be backfilled, as specified or shown in Exhibit "E," Technical Specifications, and Exhibit "F," Project Drawings. The SUBCONTRACTOR shall load, haul, place, and contour backfill, as specified. Backfill material shall be obtained from local borrow areas, as identified by the CONTRACTOR. Backfill materials collected during the stripping operation shall be placed on top of the backfill. The CONTRACTOR will verify that backfill material is uncontaminated prior to use.

SUBCONTRACTOR shall backfill below and around the export water line to allow for removal of the pipe support structure.

2.5 DEMOBILIZATION

The SUBCONTRACTOR shall perform site and equipment cleanup at the completion of Work. This includes the immediate cleanup of temporary roads used to transport contaminated material to the Container Transfer Facility, if contaminated during transport.

Demobilization shall include the decontamination and removal (as required) of the SUBCONTRACTOR-owned/leased equipment, tools, personnel, and facilities brought onto the site to perform this Work.

All submittals shall be approved by CONTRACTOR prior to demobilization.

3.0 WORK NOT INCLUDED

This Scope of Work does not include the following related work:

- Radiological control support/personnel monitoring
- Sample Technicians support
- Analytical services
- Transporting containers from the Container Transfer Facility to ERDF
- Cultural/ecological assessments or reviews
- Supplying ERDF containers and roll-on/roll-off flatbed trailers
- Supplying tarps to cover ERDF containers.

ATTACHMENT A

116-N-1 Crib, Trench, and Associated Pipelines
Bidders Information

ATTACHMENT "A"
116-N-1 CRIB, TRENCH, AND ASSOCIATED PIPELINES
BIDDERS INFORMATION

1.0 INTRODUCTION AND PURPOSE

The purpose of this attachment is to provide sufficient information on 116-N-1 treatment, storage, and disposal (TSD) unit and UPR-100-N-31 for bidders to provide prices for items supporting remediation of these sites. All conditions, restraints and programmatic areas (procurement of materials, written plans/programs, etc.) described in the Subcontract Documents that apply to site 116-N-3 also apply to 116-N-1 and UPR-100-N-31. Remediation of sites 116-N-1 and UPR-100-N-31 shall be performed after completion of work at 116-N-3.

2.0 BACKGROUND INFORMATION

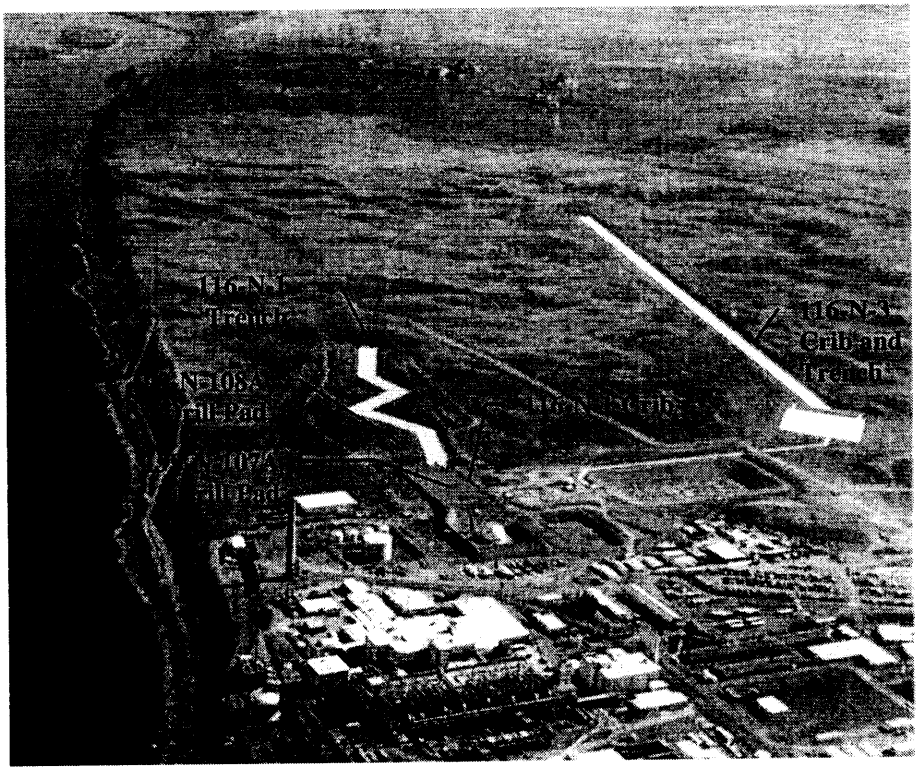
2.1 116-N-1 TREATMENT, STORAGE, AND DISPOSAL UNIT DESCRIPTION AND OPERATING HISTORY

2.1.1 116-N-1 Crib and Trench

The 116-N-1 unit is composed of two components: a crib and a zigzag-shaped trench. The crib, constructed in 1963, is approximately 88 m long by 38 m wide. The bottom of the crib is about 1.5 m below the level of the surrounding grade. Waste remediation will be to a depth of 1.5 m below the bottom of the crib and trench. Additional information regarding the crib and trench remediation zone is available in the Corrective Measures Study (CMS) (DOE-RL 1998). A sloped soil and gravel embankment forms the walls of the crib. The crib was originally excavated to a depth of about 4.5 m below the level of the surrounding grade. The crib has been backfilled at various times with boulders and cobbles to control the spread of contamination. There are three distinct layers of backfill: the lowest layer is 0.9 m thick and consists of large boulders; the middle layer is 0.6 m thick and is composed of smaller boulders; and the upper layer is 1.2 to 1.5 m thick and consists of cobble-sized material. Figure 2 is a photograph showing the existing condition of the crib.

The 116-N-1 zigzag trench was constructed in 1965 and is 490 m long by 15 m wide at the top and 3.7 m deep with sloped side walls. Water entered the trench from the north side of the crib. Boulders and cobbles were not placed in the trench as had been done in the crib. Wooden poles laid across the trench were used to support wire screening to keep out birds. The existing cover of wooden beams and wire mesh was not removed during installation of the cover panels. It will be necessary to remove and make ready for transport the beams and netting during remediation. Photographs included in Figures 3 through 5 show the trench prior to and during installation of the cover panels.

Figure 1. Aerial View of 116-N-1 Crib and Trench.



In early 1982, pre-cast concrete panels were installed to cover the entire trench, minimizing wildlife intrusion and airborne contamination. These panels created a 15 m wide cover over the top of the trench. First, concrete foundations were constructed to support concrete beams that spanned the trench. Next, pre-cast concrete panels were placed on top of the support beams, leaving all wooden poles and wire mesh in place. Panels consisted of hollow-core sections 1.2 m wide and 11 m long. The open void between the cover panel and the ground, which ran parallel to the trench, was backfilled. The long sides between the concrete panels were not grouted; however, the spaces between the ends of the panels, placed on the concrete support beams, were grouted together. After backfilling, the side slopes outside the cover were sprayed with a layer of shotcrete to prevent erosion and rodent intrusion.

The bottom of the crib was initially filled with a 0.9 m layer of large boulders. In early 1981, an additional 0.6 m layer of smaller boulders was added to the top of the large boulders to cover surface contamination that existed on the boulders. This layer started in the area around the weir box and extended northeast approximately 31 m along the length of the crib. During the months of August and September 1988, the entire crib was covered with cobble-sized material to an additional depth of 1.2 to 1.5 m. In 1995, a limited field investigation (LFI) was performed. Part of the scope of this investigation was to drill an exploratory boring in the 116-N-1 Crib to determine the potential impacts on groundwater from crib contamination. Site preparation for drilling included placing a drill pad that consists of 0.61 m of clean fill over part of the crib to provide a non-contaminated work area and shielding during drilling operations. Consequently, the actual depth of the rocks, boulders, and fill material may vary throughout the crib from approximately 2 to 4 m in depth.

In 1975, modifications were made so the water could be diverted to the newly constructed 1312-N disposal basin. Two DN900 pipelines connect the east end of the 116-N-1 weir box with the 1315-N valve pit. Opening the valves in the 1315-N valve pit would allow the water to flow from the 116-N-1 weir box through the pipe and then into the basin. Additionally, an open ditch connected the southeast corner of the 116-N-1 trench with the northwest corner of the 1312-N disposal basin. However, an earthen berm on the 116-N-1 end of the ditch prevented wastewater from entering the ditch. Consequently, wastewater was never diverted to the 1312-N disposal basin.

Figure 2. 116-N-1 Crib.

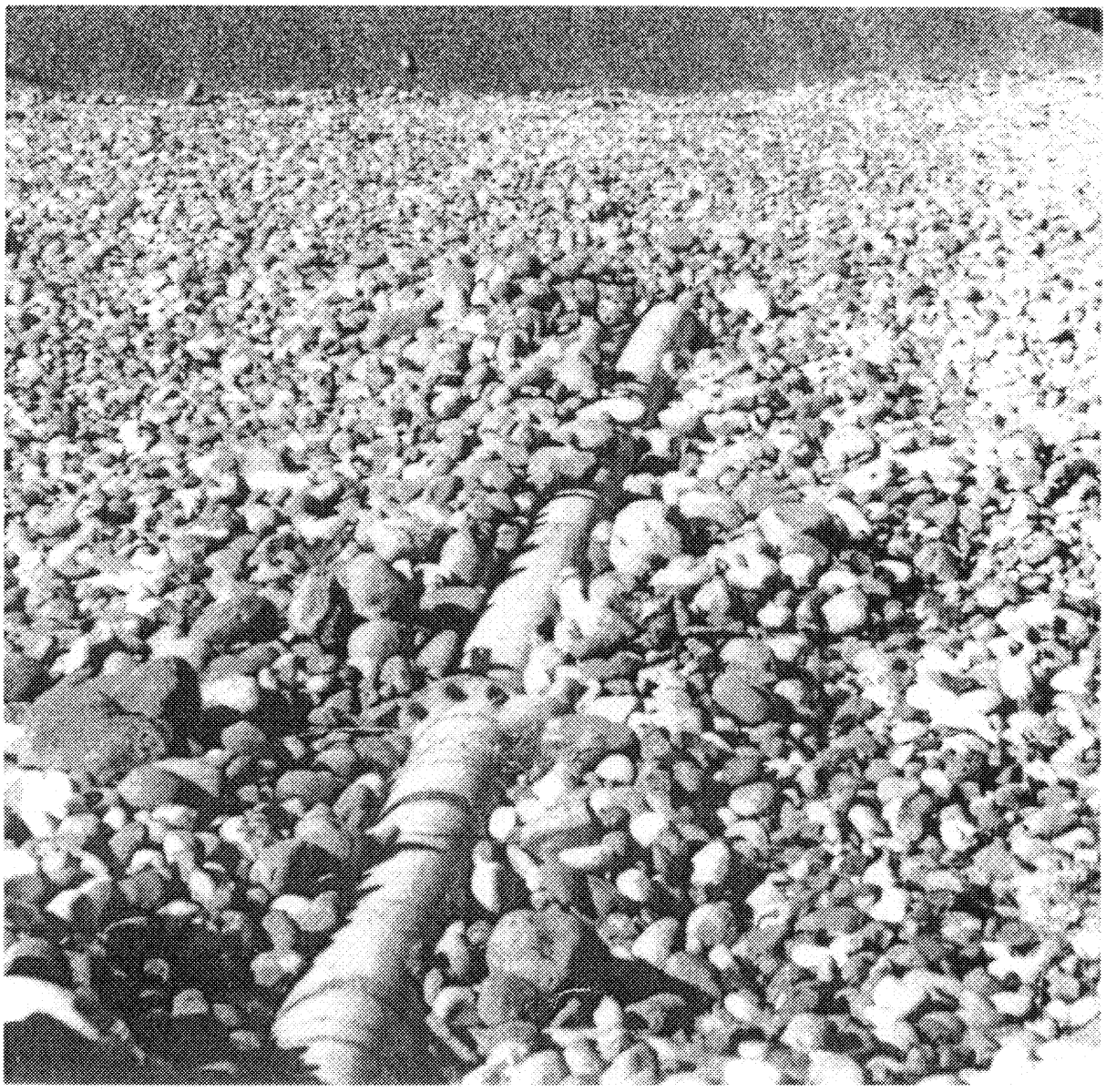


Figure 3. 116-N Trench in 1980's During Concrete Beam and Cover Installation.

Figure 4. Concrete Support Beams for 116-N-1 Trench Cover Installation During 1980's.

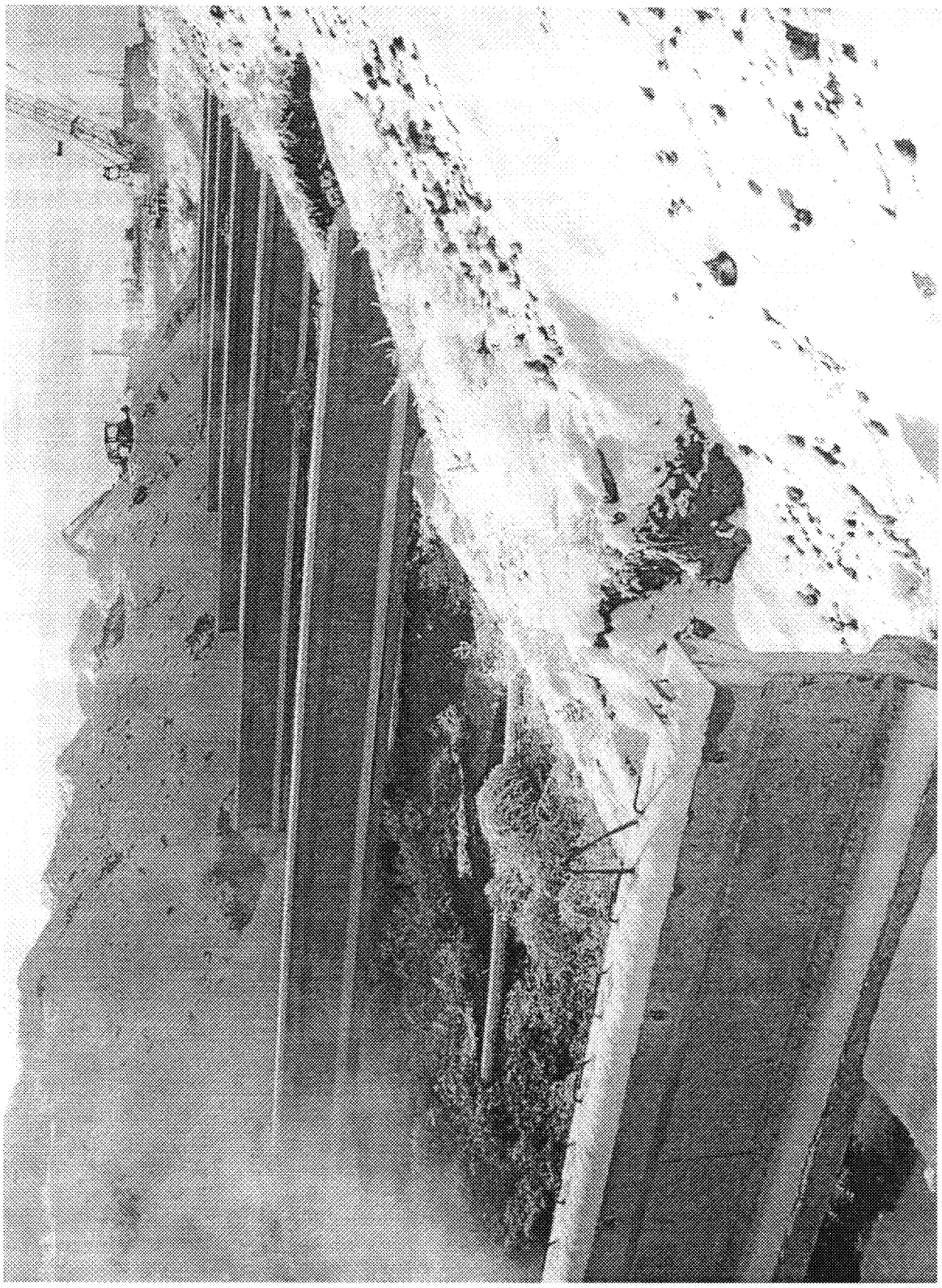


Figure 5. Cover Placement and Side Slope Construction for 116-N-1 Trench During 1980's.

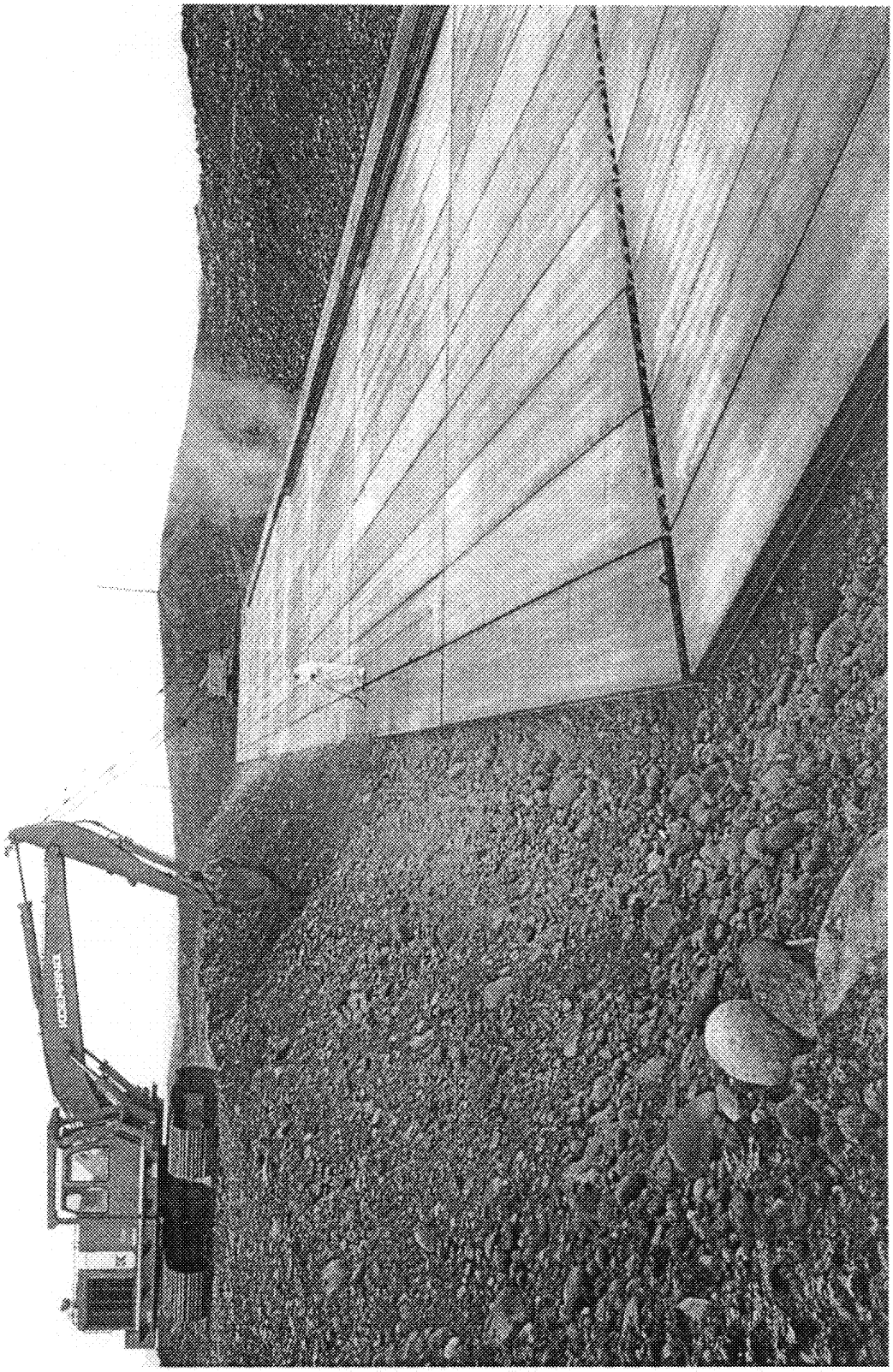


Figure 6. Aerial View of 100-N Area

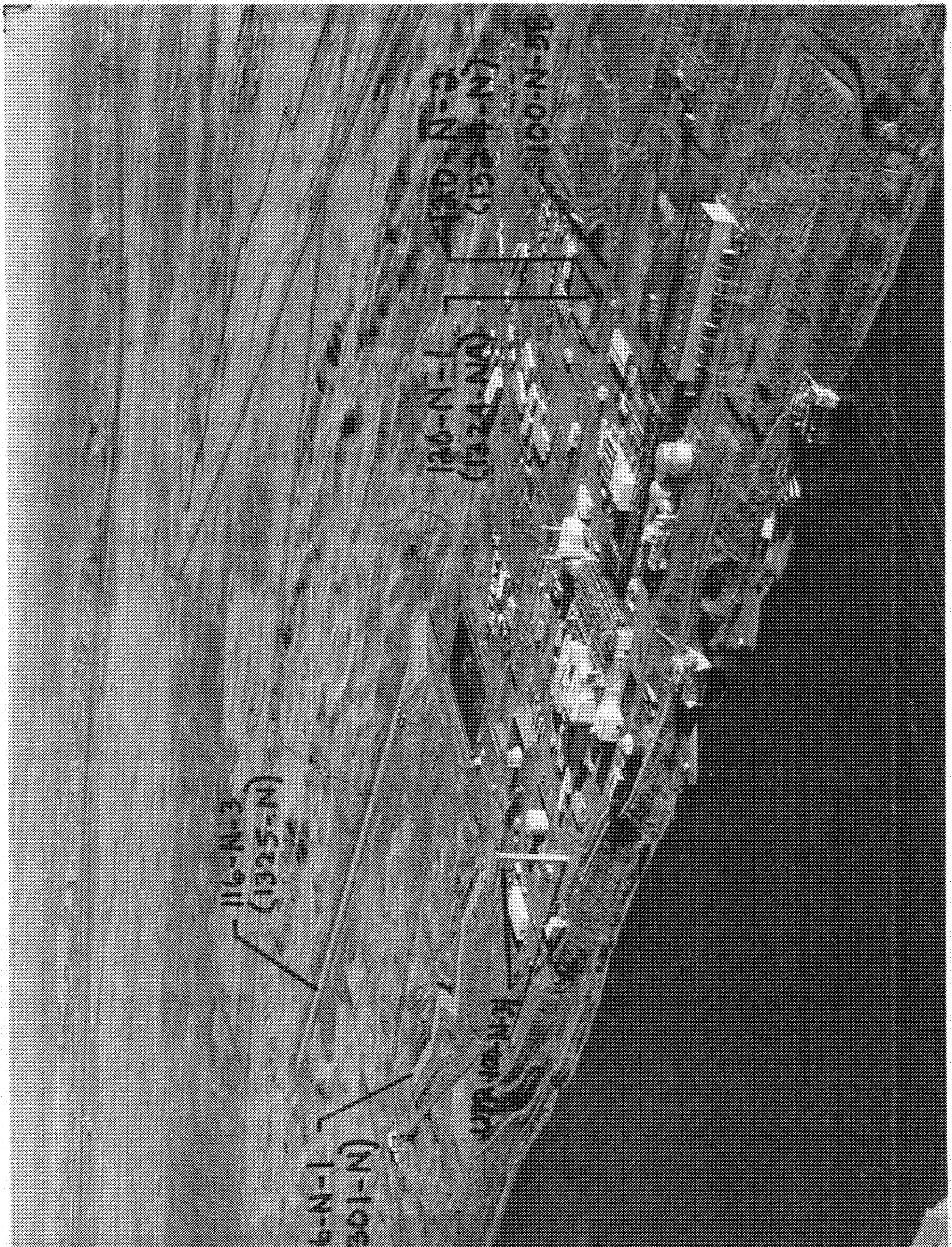


Figure 7. Aerial View of 116-N-1 Trench, 199-N-108A Drill Pad, 116-N-1 Crib, 199-N-107A Drill Pad

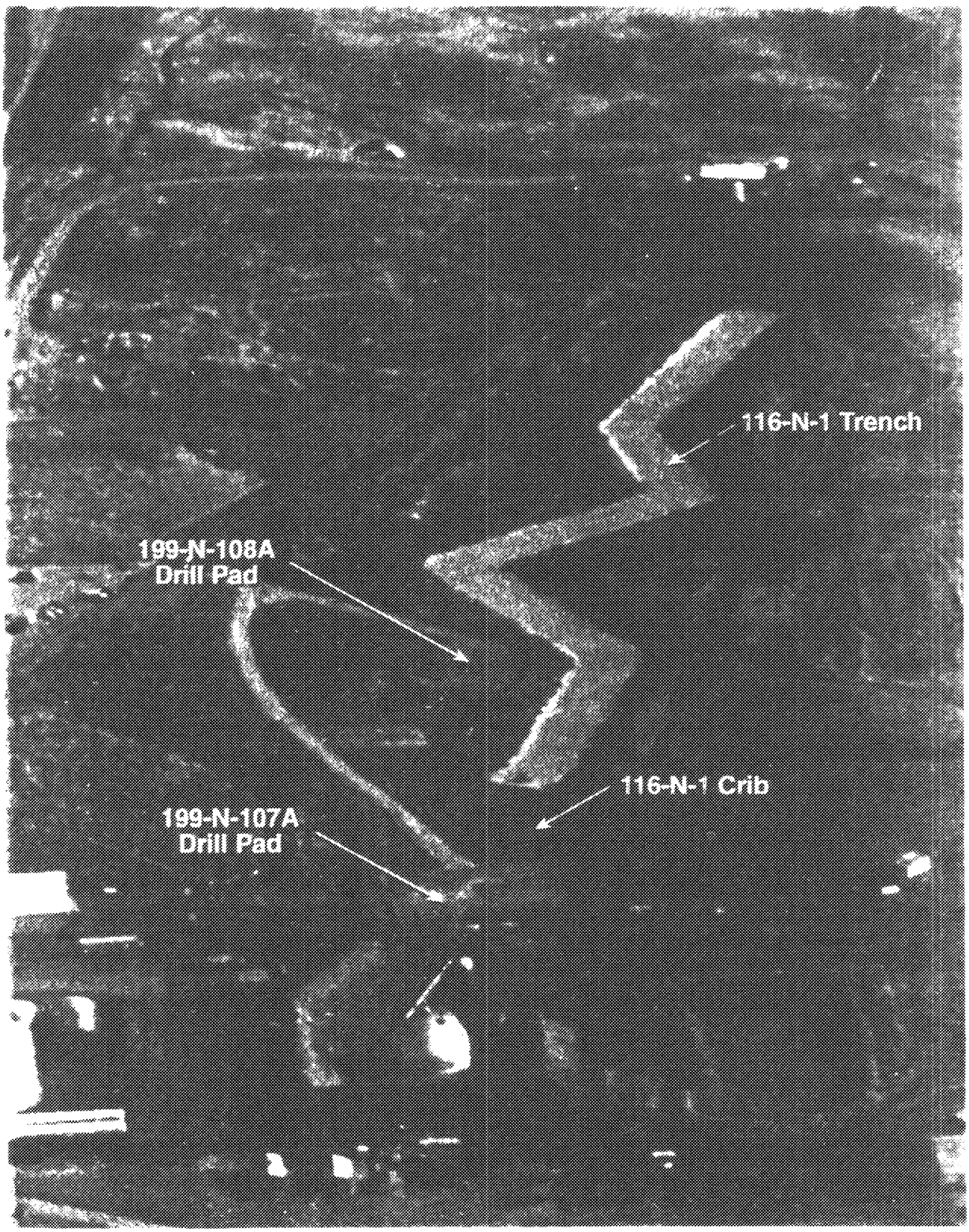
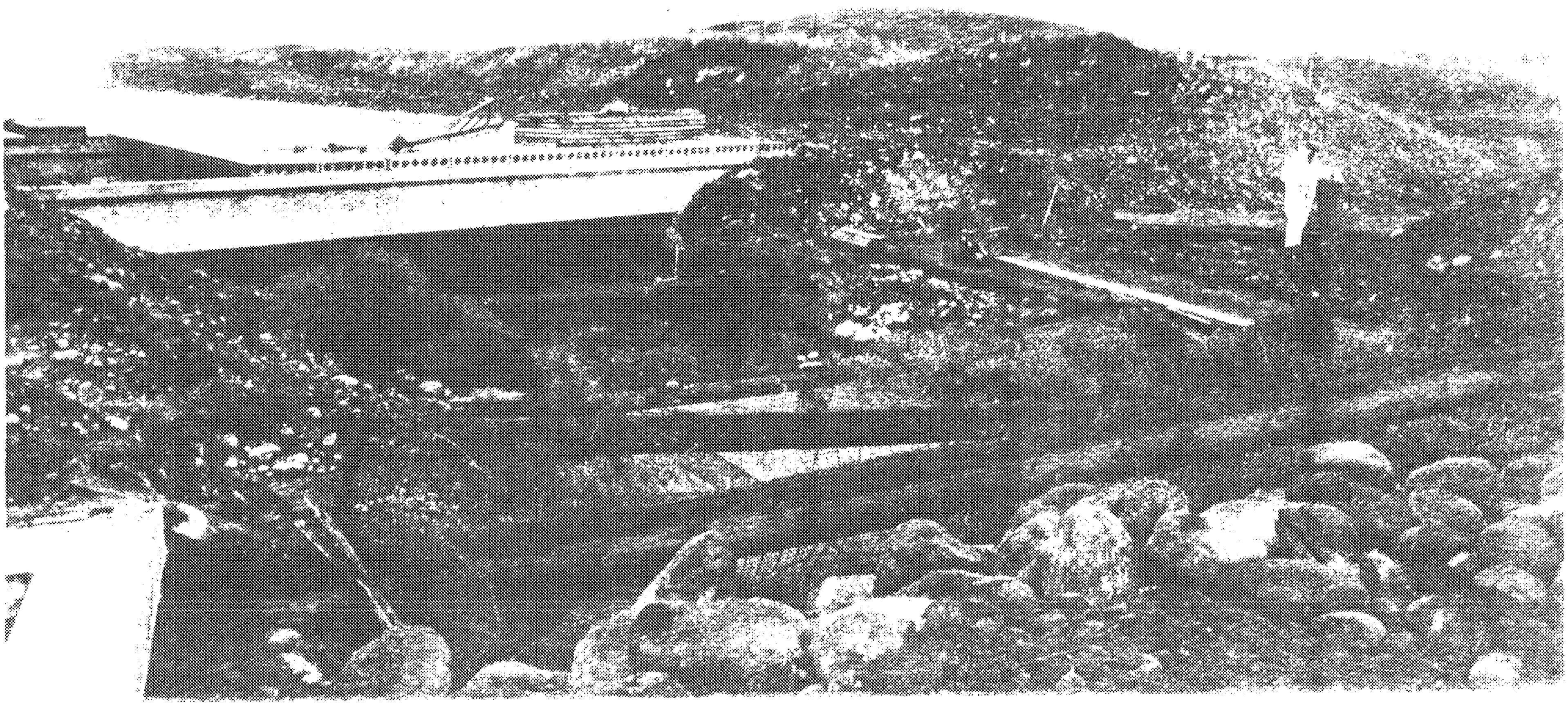


Figure 8. Fencing, Wood Structures, Support Beams and Panels at 116-N-1 Looking From Edge of Crib and Trench.



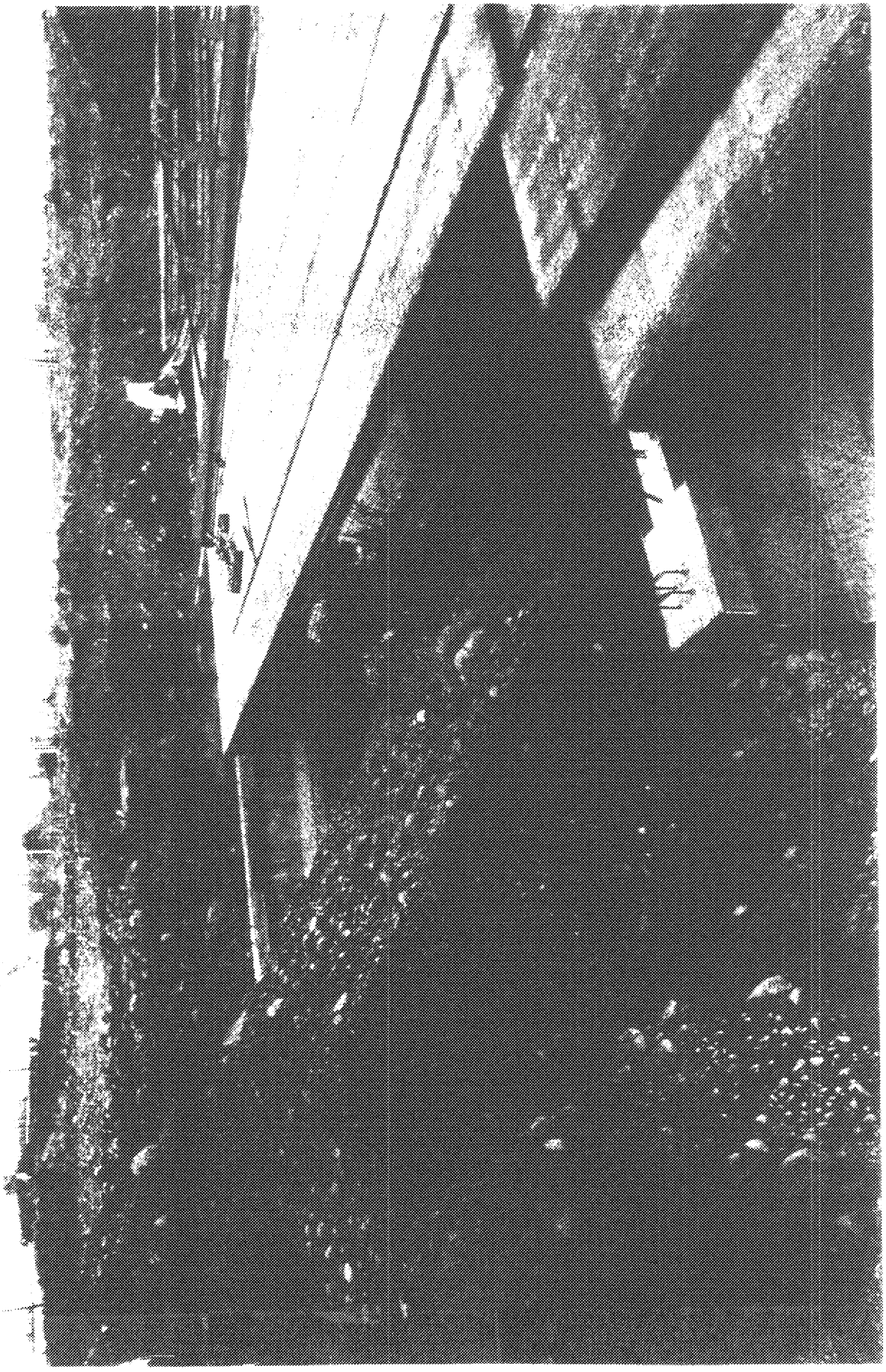


Figure 9. Cover at 1300-N Trench Near Boulder Field/Crib Looking From Trench Toward Crib (116-N-1)

Figure 10. 116-N-1 Crib During Operations (Looking NE)

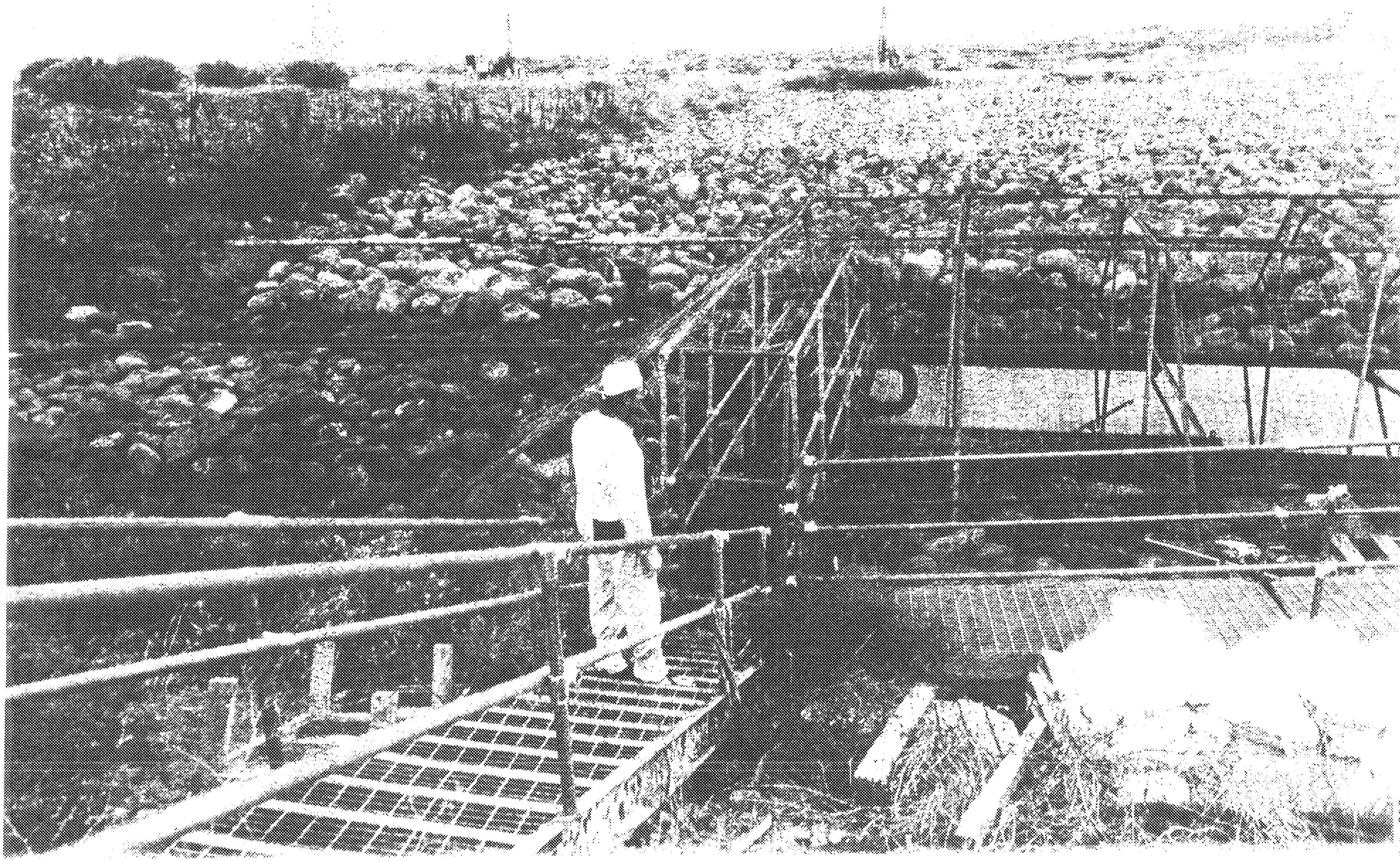
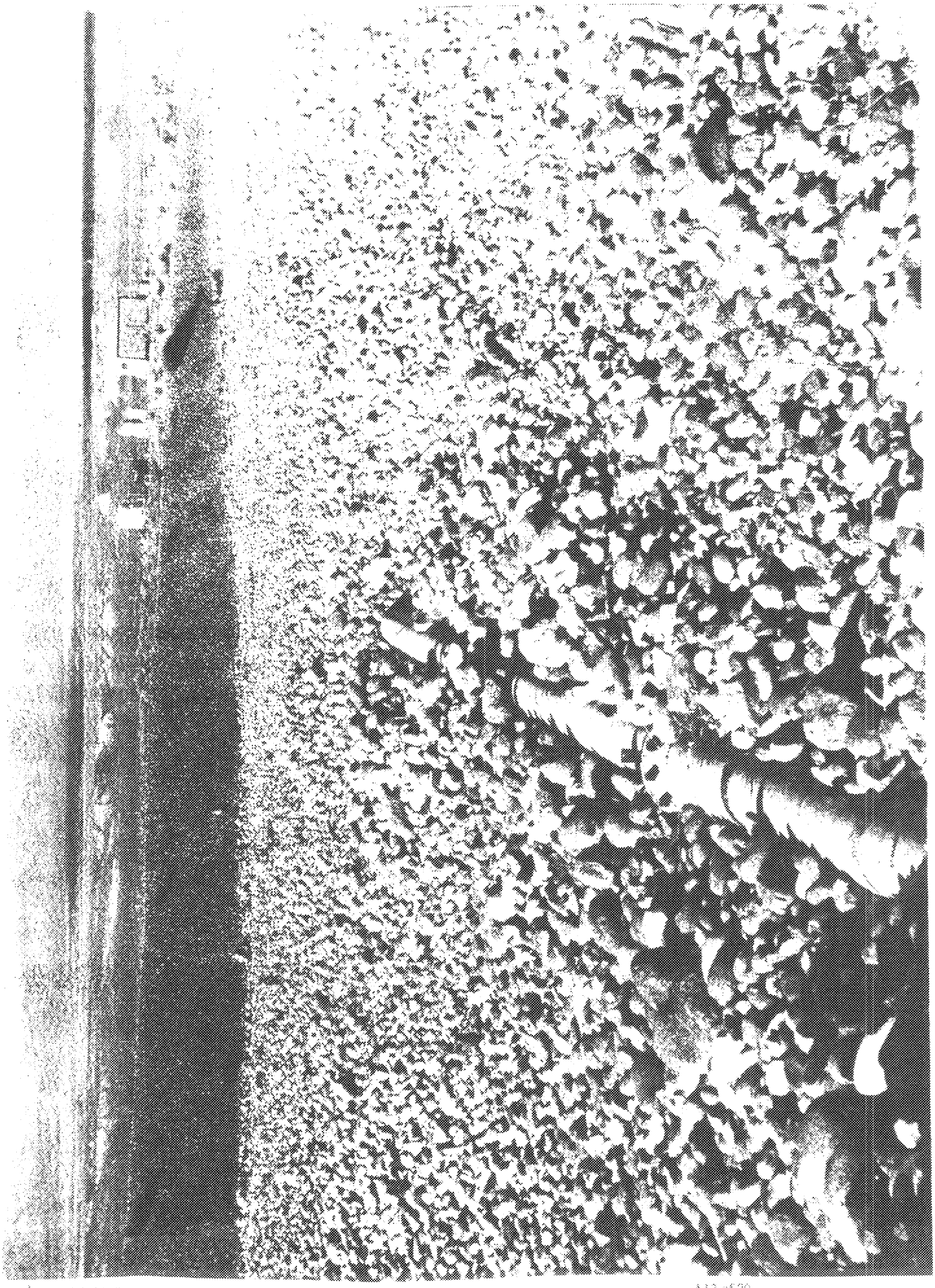
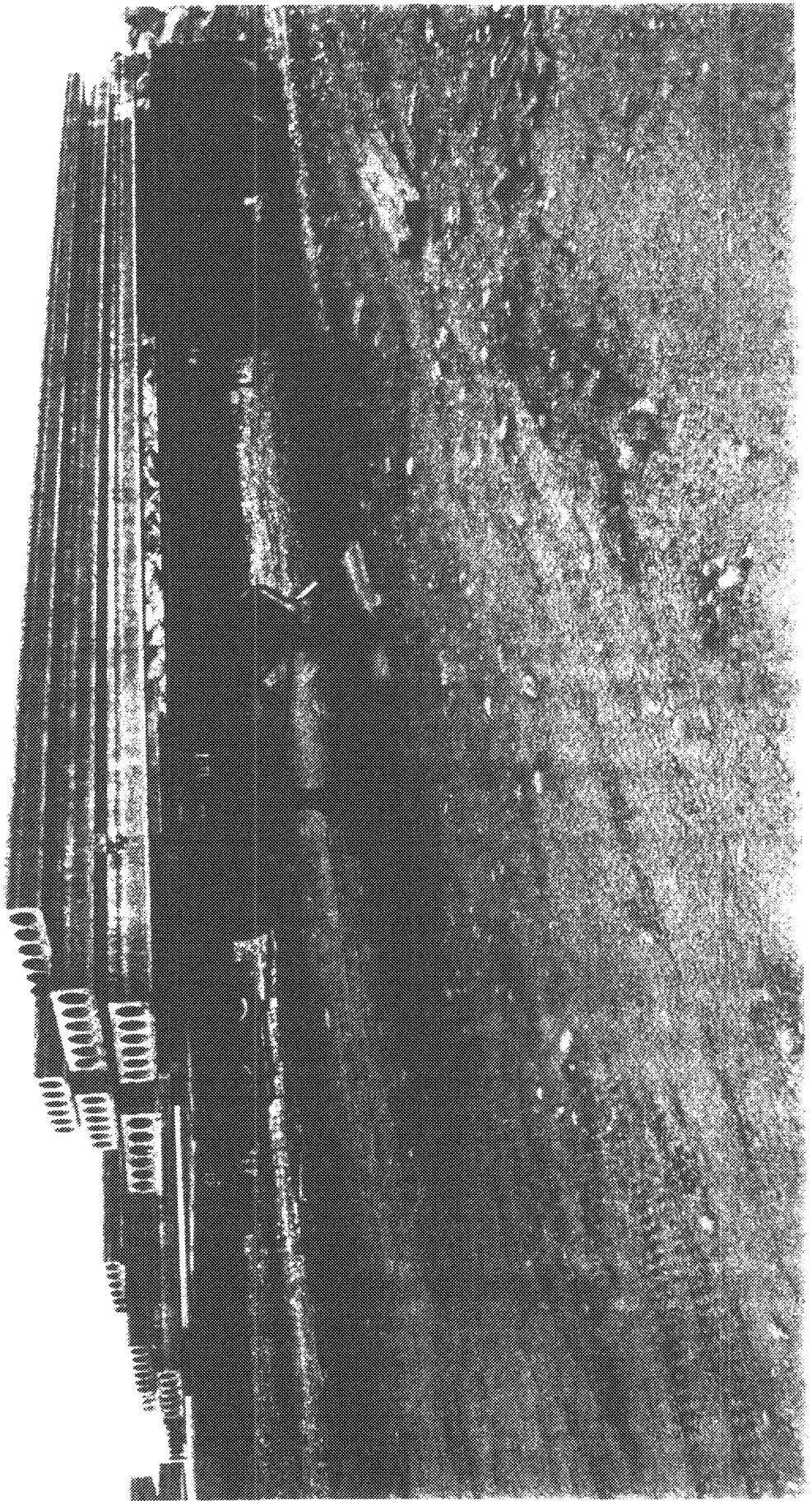


Figure 11. 1301-N Crib. Capped End Pipe Southeast Corner Looking North (3/6/95)





An underground DN900 main effluent line from the 105-N lift station discharged into the crib through a 16 m by 3.7 m concrete weir box, which was initially open on top. The weir box, commonly referred to as the "horse trough," was designed to simply fill and overflow into the crib. An underground DN300 diameter effluent drain line from the N Reactor basin floor drains also discharged into the crib.

2.1.2 116-N-1 Associated Pipelines

Buried pipelines associated with the 116-N-1 site consist of approximately 2,200 m of pipe, ranging in size from DN40 to DN900. Because there is no process history indicating that the pipelines ever leaked, there is no known soil contamination associated with these pipelines. Nevertheless, it is possible that leaks have occurred and contamination is present, but went undetected. The condition of the pipes, internal contamination, and the extent and nature of any soil contamination shall be assessed during remedial action (RA).

A listing of known Hanford drawings showing the detailed location and pipe characteristics of known pipelines is included at the end of this attachment.

Six known pipelines feed effluent to the 116-N-1 unit. The pipelines, including two lines from the 1722-N Building (adjacent to the 105-N Building), pass through the 1322-N Building, and end at the 116-N-1 weir box. One pipeline is labeled as a contaminated drain pipe; the other pipeline is a radioactive drain pipe. Two lines feed effluent from the 116-N-2 facility (also known as the 1310-N Golf Ball); one is a contaminated drain and the other is a radioactive drain. Also coming from the 116-N-2 facility directly to the 116-N-1 Crib is a chemical waste pipe. The final pipeline addressed in these specifications is a radioactive drain line from the 1322-N Building to the 116-N-1 Crib. It is possible that additional pipelines will be encountered during remediation. There is an exposed pipeline of unknown origin that can be seen in the southwest corner of the crib. Other such pipelines will likely exist. It is also likely that asbestos was used to wrap some of the pipelines associated with 116-N-1. The location of the asbestos will need to be verified by the SUBCONTRACTOR prior to remediation.

The DN 900 pipe is directly beneath the 1322-NC facility. The 1322-NC facility is 4.3 m long, 1.1 m wide, with 150 mm thick reinforced concrete walls, floor, and roof. The structure extends from ground surface to the depth of 610 mm below the pipe invert.

The DN900 discharge lines from the weir box to the 116-N-3 Crib were addressed as part of design and remediation of the 116-N-3 unit.

2.1.3 Unplanned Release Site – UPR-100-N-31

The UPR-100-N-31 spill occurred on July 22, 1974, while sample lines were being installed in a DN150 steel casing through the berm on the west side of the 116-N-1 Crib. During sample line installation, the water level in the crib was raised from 380 to 460 mm as a result of an emergency dump tank drawdown test. Due to the increased water level, approximately 4,000 L of effluent water containing fission and activation products flowed through the casing and were discharged to the soil. An area of approximately 188 m^2 was contaminated. The spill is located

at Washington State Plane coordinates E571411, N149699. Sand and fines were used to stabilize the soil contamination prior to soil removal and disposal in the 200 Area. After the contaminated soil was removed, clean fill material was used to restore the site. There are no structures (e.g., concrete foundations or pipelines) associated with this waste site. The site currently has no postings, fences, or access restrictions associated with the waste site itself since the contaminated soils have been removed and disposed. However, no known confirmatory sampling exists; therefore, it is unknown if the site meets current cleanup standards.

3.0 SITE INFORMATION

3.1 CURRENT SITE CONDITIONS

Currently, the 116-N-1 site is enclosed by a chain-link fence topped with barbed wire and posted with signs reading DANGER - UNAUTHORIZED PERSONNEL KEEP OUT, CAUTION, RADIATION AREA, RADIOLOGICALLY CONTROLLED AREA, UNDERGROUND RADIOACTIVE MATERIAL, NO TRESPASSING, and SURFACE CONTAMINATION. Access is controlled by a lock and key, with the keys held by the Environmental Restoration Contractor. There are two access roads inside the fence; one road provides access to the crib, and the other road provides access to the trench.

At the 116-N-1 unit, the radiation measurements are decreasing slightly through the years, reflecting the continuing decay of radionuclide inventory in 116-N-1. Dose rates measured near the unit in 1995 showed an annual average decrease of approximately 18% from 1994 levels. In a 1995 survey, radiation measurements taken at 1 m above the 116-N-1 Trench concrete panels (at the portion closest to the crib) were about 300 mrem/hr. A map showing measured dose readings in the site area is included with the Information to Bidders.

During drilling performed from late 1995 to early 1996 for the 116-N-1/116-N-3 LFI, the background at the 199-N-108A drill pad (next to the 116-N-1 Trench) ranged from 1 to 3 mrem/hr. Drums filled with water were placed between the trench (i.e., the source) and the workers on the drill pad to provide shielding from radiation.

The 116-N-1 Crib boulders are suspected of having soil contamination with the highest radionuclide concentrations. During the 116-N-1/116-N-3 LFI, the highest radiation readings (up to 350 mrem/hr) and the highest concentrations of cobalt-60, cesium-137, strontium-90, and plutonium-239/240 were detected in the soil removed from the crib boulders.

3.2 CONTAMINANTS OF CONCERN AT 116-N-1 AND UPR-100-N-31.

3.2.1 116-N-1 Crib, Trench, and Associated Pipelines

The contaminants of concern (COCs) in the surface soils in the 116-N-1 Crib (defined as the top 4.6 m below surrounding grade under a rural-residential scenario) were derived from data collected in the LFIs (DOE-RL 1995 and 1996). These contaminants include cesium-137, cobalt-60, europium-154, europium-155, plutonium-239/240, strontium-90, and tritium. Nitrate

and mercury were added because historical information indicated that these contaminants may be present. No surface soils are found within 4.6 m of the surrounding grade at the 116-N-1 Trench; therefore, no COCs exist at the trench.

A subsurface soil layer, 0.9 to 1.5 m thick, exists at a depth greater than 4.6 m below surrounding grade beneath the 116-N-1 Crib and Trench. This layer contains plutonium-239/240.

3.2.2 UPR-100-N-31

If residual contamination exists at UPR-100-N-31, it is assumed that the contamination would only exist in surface soils and that the same COCs that are present in the surface soils at 116-N-1 would possibly be present in the surface soils at UPR-100-N-31. Surface soils in the UPR-100-N-31 spill are assumed to contain radionuclides (i.e., cesium-137, cobalt-60, europium-154, europium-155, plutonium-239/240, strontium-90, and tritium) and possibly nitrate and mercury at concentrations above the cleanup standards.

3.3 GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

Stratigraphic divisions underlying the 100-N Area include the Hanford formation, the Ringold Formation, and the Elephant Mountain Member of the Saddle Mountains Basalt. The Hanford formation overlies the Ringold Formation and consists of two gravel-dominated facies: an upper cobble-boulder unit and a lower pebble-cobble unit. The Ringold Formation overlies the Elephant Mountain Member and consists of seven units. Thickness ranges for the Hanford formation and the Ringold Formation are 5.8 to 24.5 m and 137.2 to 150.6 m, respectively.

The upper portion of the Hanford formation is composed of unconsolidated basaltic cobble and boulder-sized clasts. Cobbles as large as 150 mm were encountered during drilling in the vicinity of the units, although boulders as large as 0.9 m can be seen around the 116-N-1 unit. Below the cobble-boulder unit, clast size decreases to pebbles and cobbles with local dominant sand. The gravel and sand are predominantly basaltic in composition. Sometimes significant sand layers are intercepted during drilling. Sand layers from 3 to 4.9 m thick, consisting of very coarse to fine sand, have been encountered. In the vadose zone, sand layers may have promoted the localized lateral spread of contamination from the 116-N-1 site during operation of the units. The sand zones are discontinuous and cannot, with certainty, be traced between wells.

Extensive grading, excavating, and backfilling of the surficial Hanford formation have occurred within and around the 116-N-1 site. Consequently, it is difficult to distinguish undisturbed Hanford formation from anthropogenically disturbed Hanford formation because of similar bulk composition. The zone of disturbed material is up to 6.1 m thick and consists of unconsolidated basaltic cobble- to boulder-sized clasts with sand infilling. Clasts often exhibit white calcium carbonate coatings.

The underlying Ringold Formation is composed of fluvial pebble- to cobble-sized gravels with a silty sandy matrix. The sediments range from well cemented, with carbonates and/or iron oxides, to uncemented. Cementation is discontinuous but laterally extensive. Basalt content of the gravels is typically less than 50% by volume. Some thin discontinuous sand lenses are found in the areas of the 116-N-1 site. The contact between the Hanford formation and the Ringold

Formation is sometimes difficult to determine because a transition zone of reworked Ringold Formation is often present. The contact is a potential perching layer in the vadose zone because of the cemented nature of the Ringold Unit E. However, no perched water was observed during the 1995 to 1996 LFI activities.

Groundwater in the unconfined aquifer flows primarily in a west-northwesterly direction most of the year and discharges to the Columbia River. Fluctuations in river stage due to dam operations and seasonal variations can impact the flow direction, hydraulic gradients, and groundwater levels within the unconfined aquifer. The significant stratigraphic divisions at and above the water table at the 116-N-1 site are the Ringold Formation and the Hanford formation. The water table is located at a depth of approximately 21 m below ground level. The unconfined aquifer is contained in the gravel-dominated Ringold Unit E lithofacies of the Ringold Formation.

HANFORD SITE DRAWINGS

The drawings listed below are available to the SUBCONTRACTOR.

DRAWING NUMBER	REVISION NUMBER	TITLE
H-1-44540	2	1301-N Trench Cover Plot Plan
H-1-44541	2	1301-N Trench Cover Beam and Footing Location Plan
H-1-44542	1	1301-N Trench Cover First Leg Plan
H-1-44543	1	1301-N Trench Cover Second Leg Plan
H-1-44544	2	1301-N Trench Cover Third Leg Plan
H-1-44545	1	1301-N Trench Cover Fourth Leg Plan
H-1-44546	1	1301-N Trench Cover Fifth Leg Plan
H-1-44547	3	1301-N Trench Cover Sixth Leg and Overflow Plan
H-1-44548	2	1301-N Trench Cover Sections and Details
H-1-28855	3	1301-N Trench Cover Crib Extension Trench
H-1-30581	11	Structural Crib Miscellaneous Details
H-1-30589	11	Civil, Paving, Grading and Drainage – Sheet 4
H-1-38984	6	Structural Valve Pit Plan, Section & Details
H-1-38989	5	Eng. Dia. Emerg. React. Cool Flush Drain Sys.
H-1-50186	1	Strl Plans, Sect and Det Weir Cover, Sheet 1
H-1-50186	0	Strl Plans, Sect and Det Weir Cover, Sheet 2
H-1-45007 Sht 29	4	Composite Underground Lines
H-1-45007 Sht 30	5	Composite Underground Lines

DRAWING NUMBER	REVISION NUMBER	TITLE
H-1-45007 Sht 31	5	Composite Underground Lines
H-1-45007 Sht 36	3	Composite Underground Lines
H-1-45007 Sht 37	4	Composite Underground Lines
H-1-45007 Sht 38	3	Composite Underground Lines
H-1-45007 Sht 43	3	Composite Underground Lines
H-1-45007 Sht 44	4	Composite Underground Lines
H-1-45007 Sht 45	2	Composite Underground Lines
H-1-45007 Sht 49	3	Composite Underground Lines
H-1-45007 Sht 50	4	Composite Underground Lines
H-1-45007 Sht 51	3	Composite Underground Lines
H-1-45007 Sht 56	5	Composite Underground Lines
H-1-45007 Sht 57	2	Composite Underground Lines
H-1-45007 Sht 58	3	Composite Underground Lines

ATTACHMENT B

- Limits of Pipe Excavation
- Export Water Pipe Support Details
- Export Water Pipe Support Plan and Section
- Typical Cross Section 116-N-1 Crib and Trench

Limits of pipe excavation:

Figure 1 – Piping within the berm around the 1310-N "golfball" is deleted from this scope of work. The piping removed is "clouded" as shown on attached figure 1.

Figure 2 – The limit of the DN 250 and DN 900 pipes is the extent of the 1722 N building. All "clouded" pipe shown on figure 2 is removed from this scope of work.

Figure 3 – The limit of the DN 40 hose in DN 100 transite stops at the 1714-N building. The "clouded" portion of the pipe shown on figure 3 is removed from this scope of work.

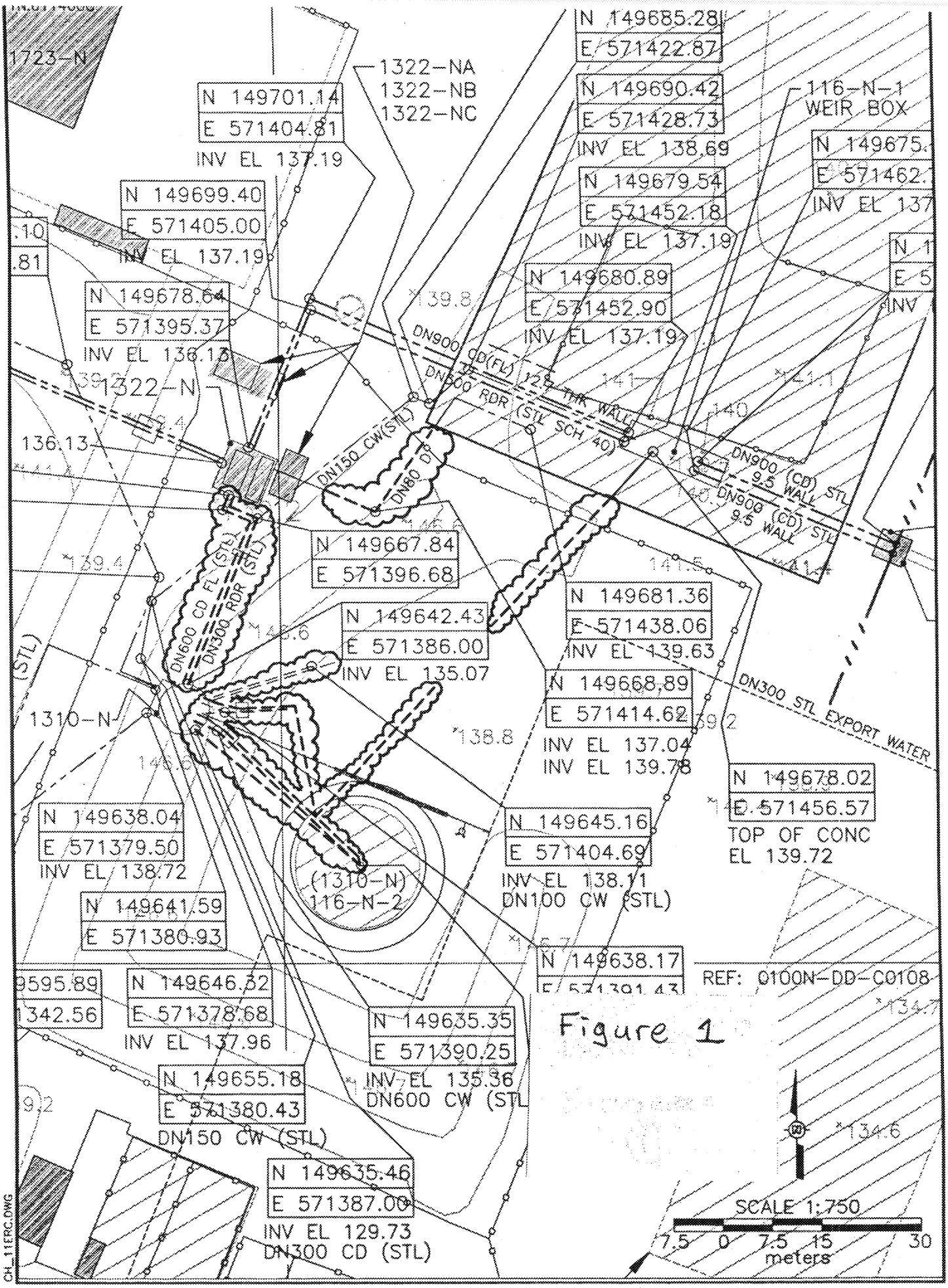
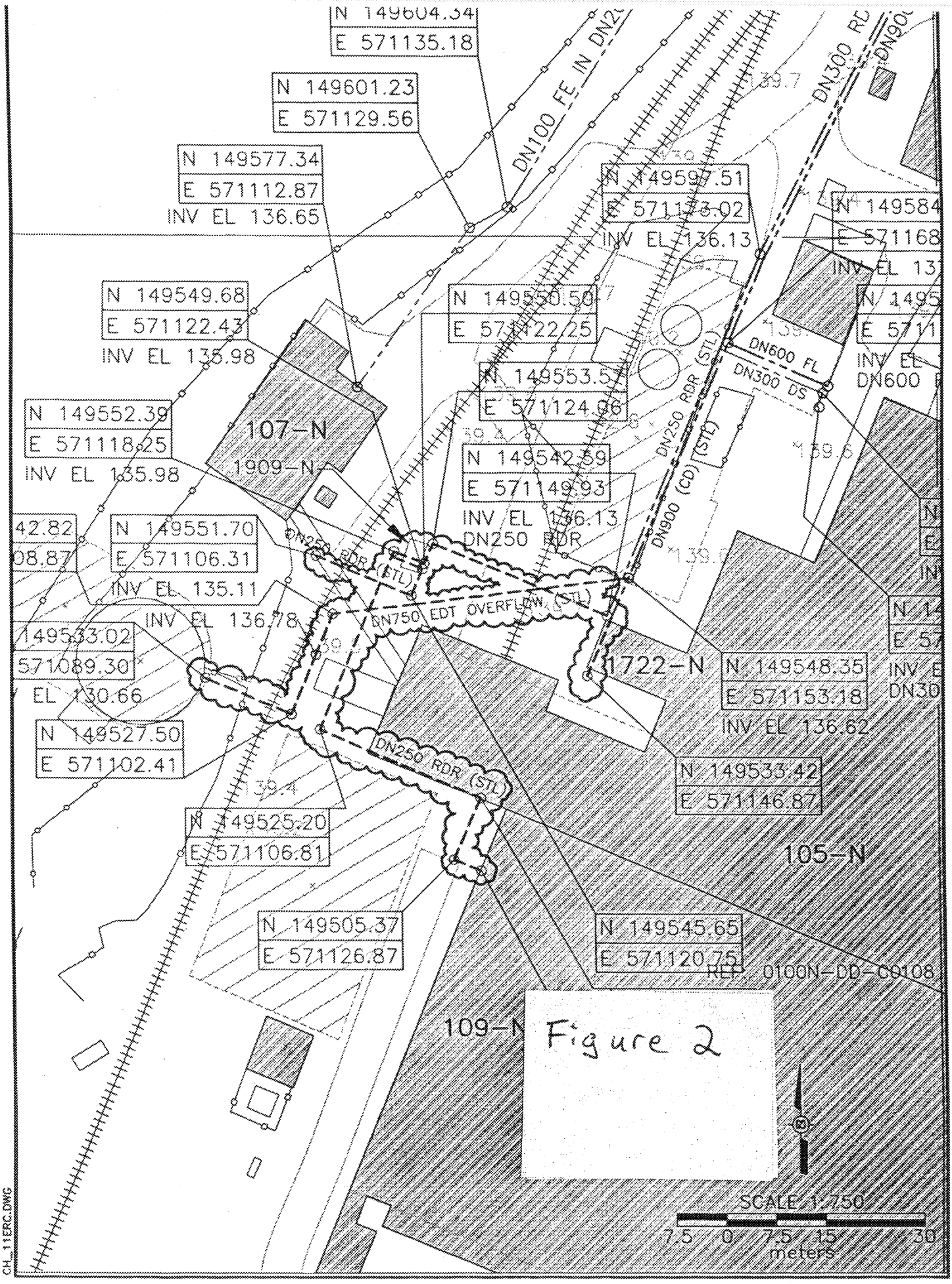

1723-N
1322-NA
1322-NB
1322-NC
N 149701.14
E 571404.81
INV EL 137.19
N 149685.28
E 571422.87
N 149690.42
E 571428.73
INV EL 138.69
116-N-1
WEIR BOX
N 149679.54
E 571452.18
INV EL 137.19
N 149699.40
E 571405.00
INV EL 137.19
N 149680.89
E 571452.90
INV EL 137.19
N 149678.64
E 571395.37
INV EL 136.18
1322-N
DN900 CD(FL)
DN900 RDR
12.5 THK WALL
(STL SCH 40)
DN150 CW(STL)
DN80 DI
DN900 (CD) 9.5 WALL STL
136.13
N 149667.84
E 571396.68
N 149642.43
E 571386.00
INV EL 135.07
DN600 CD FL (STL)
DN300 RDR (STL)
N 149681.36
E 571438.06
INV EL 139.63
N 149668.89
E 571414.62
INV EL 137.04
INV EL 139.78
DN300 STL EXPORT WATER
1310-N
N 149678.02
E 571456.57
TOP OF CONC
EL 139.72
N 149638.04
E 571379.50
INV EL 138.72
N 149645.16
E 571404.69
INV EL 138.11
DN100 CW (STL)
(1310-N)
116-N-2
N 149641.59
E 571380.93
N 149638.17
REF: 0100N-DD-C0108
N 149646.32
E 571378.68
INV EL 137.96
N 149635.35
E 571390.25
INV EL 135.36
DN600 CW (STL)
N 149655.18
E 571380.43
DN150 CW (STL)
N 149635.46
E 571387.00
INV EL 129.73
DN300 CD (STL)
SCALE 1:750
7.5 0 7.5 15 30
meters
CH_11ERC.DWG

Figure 1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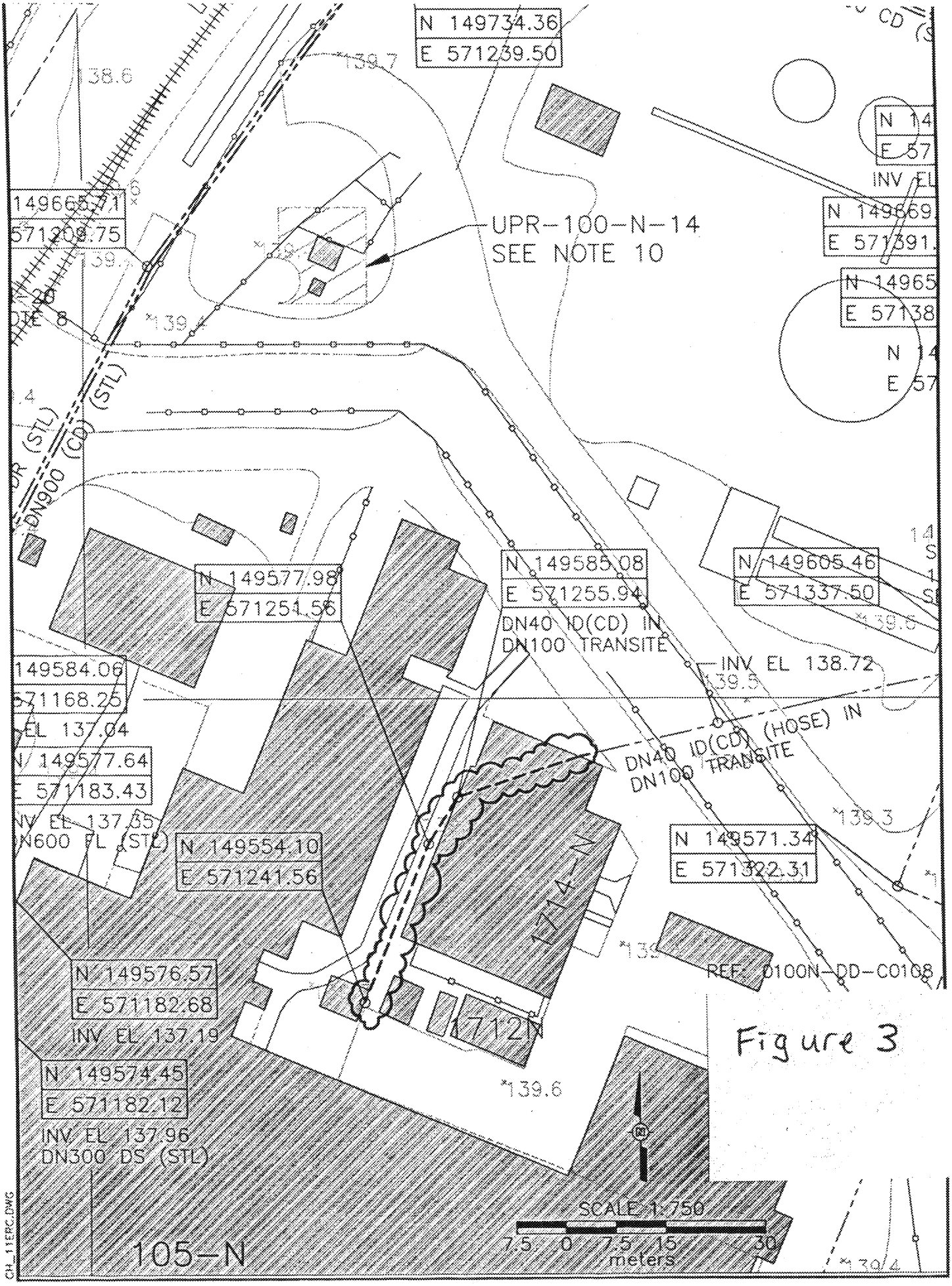
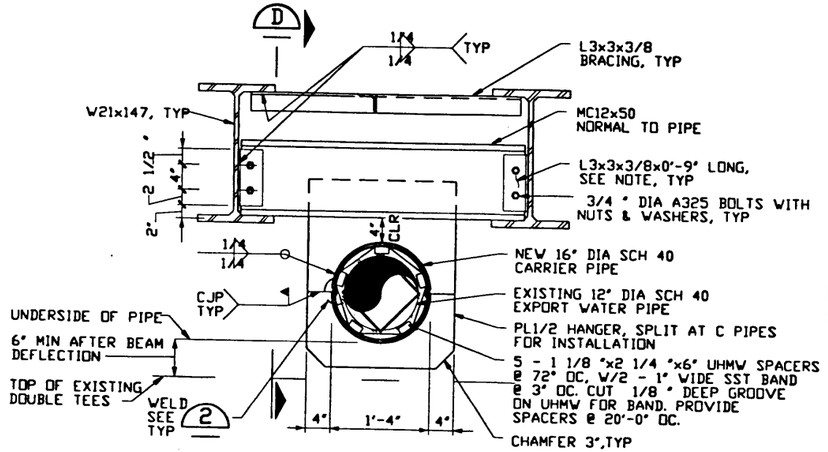
E 571135.18
N 149601.23
E 571129.56
N 149577.34
E 571112.87
INV EL 136.65
DN100 FE IN DN2
DN300 RD
DN90
N 149597.51
E 571173.02
INV EL 136.13
N 149584
E 571168
INV EL 13
N 1495
E 5711
INV EL
DN600
N 149549.68
E 571122.43
INV EL 135.98
N 149550.50
E 571122.25
N 149553.57
E 571124.96
DN600 FL
DN300 DS
DN250 RDR (STL)
DN900 (CD) (STL)
N 149552.39
E 571118.25
INV EL 135.98
107-N
1909-N
N 149542.59
E 571149.93
INV EL 136.13
DN250 RDR
42.82
08.87
N 149551.70
E 571106.31
INV EL 135.11
INV EL 136.78
DN250 RDR (STL)
DN750 EDT OVERFLOW (STL)
149533.02
571089.30
EL 130.66
1722-N
N 149548.35
E 571153.18
INV EL 136.62
INV E
DN30
N 149527.50
E 571102.41
DN250 RDR (STL)
N 149533.42
E 571146.87
N 149525.20
E 571106.81
105-N
N 149505.37
E 571126.87
N 149545.65
E 571120.75
REF: 0100N-DD-C0108
109-N
Figure 2
SCALE 1:750
7.5 0 7.5 15 30
meters

CH_11ERC.DWG

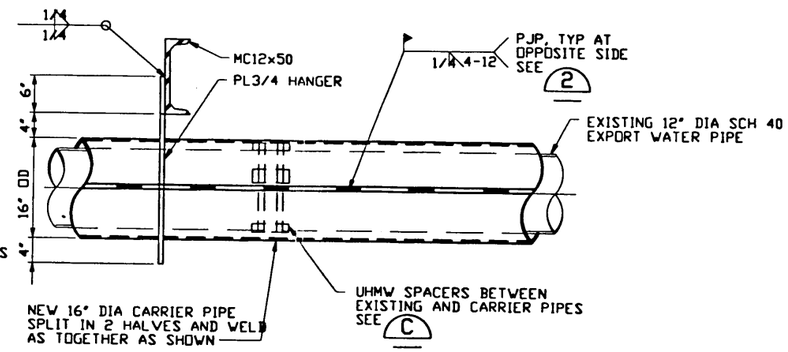

N 149734.36
E 571239.50
UPR-100-N-14
SEE NOTE 10
N 149577.98
E 571251.56
N 149585.08
E 571255.94
DN40 ID(CD) IN
DN100 TRANSITE
N 149605.46
E 571337.50
INV EL 138.72
DN40 ID(CD) (HOSE) IN
DN100 TRANSITE
N 149584.06
E 571168.25
INV EL 137.04
N 149577.64
E 571183.43
INV EL 137.65
DN600 FL (STL)
N 149554.10
E 571241.56
N 149571.34
E 571322.31
REF: D100N-DD-C0108
N 149576.57
E 571182.68
INV EL 137.19
N 149574.45
E 571182.12
INV EL 137.96
DN300 DS (STL)
105-N
SCALE 1:750
7.5 0 7.5 15 30
meters
Figure 3



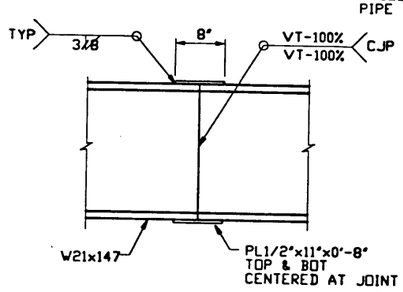
SECTION C
1"=1'-0"

NOTE:

FABRICATE CONNECTION ANGLES FROM 3/8 " PLATE TO FIT ACTUAL ANGLE BETWEEN EXPORT WATER PIPE AND W21x147 SUPPORT BEAMS.



SECTION D
1"=1'-0"

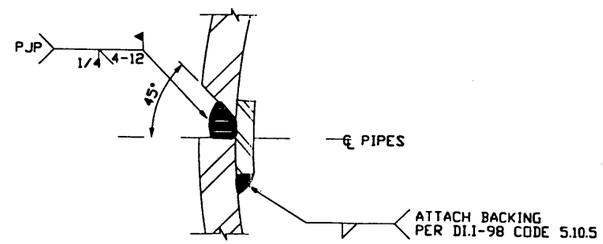


NOTES:

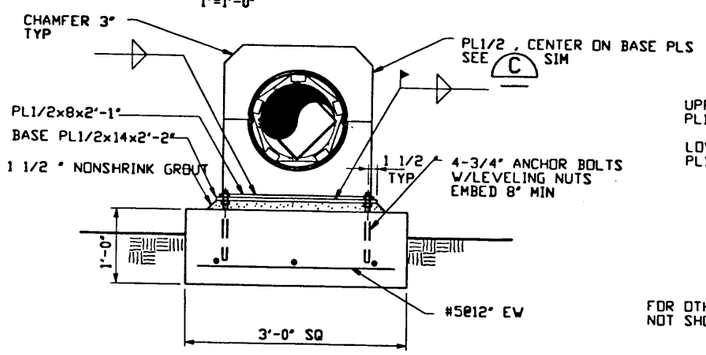
LOCATE SPLICES AT 1/3 POINTS, IF REQUIRED.

BEAM SPLICE

DETAIL 1
1"=1'-0"

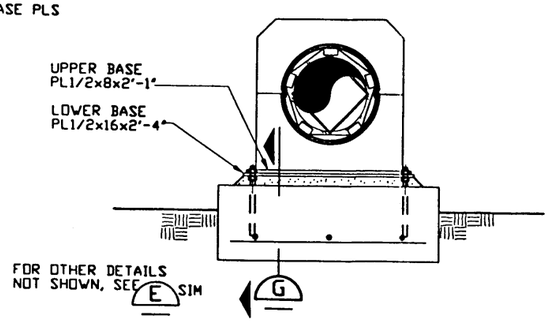


DETAIL 2
1"=1"



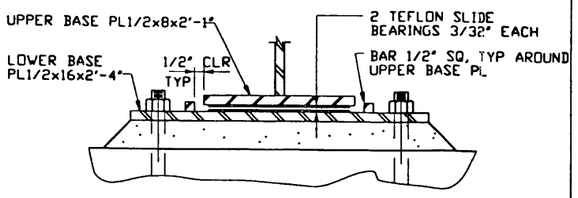
FIXED BEARING PIPE SUPPORT

SECTION E
1"=1'-0" XX



FIXED BEARING PIPE SUPPORT

SECTION F
1"=1'-0" XX



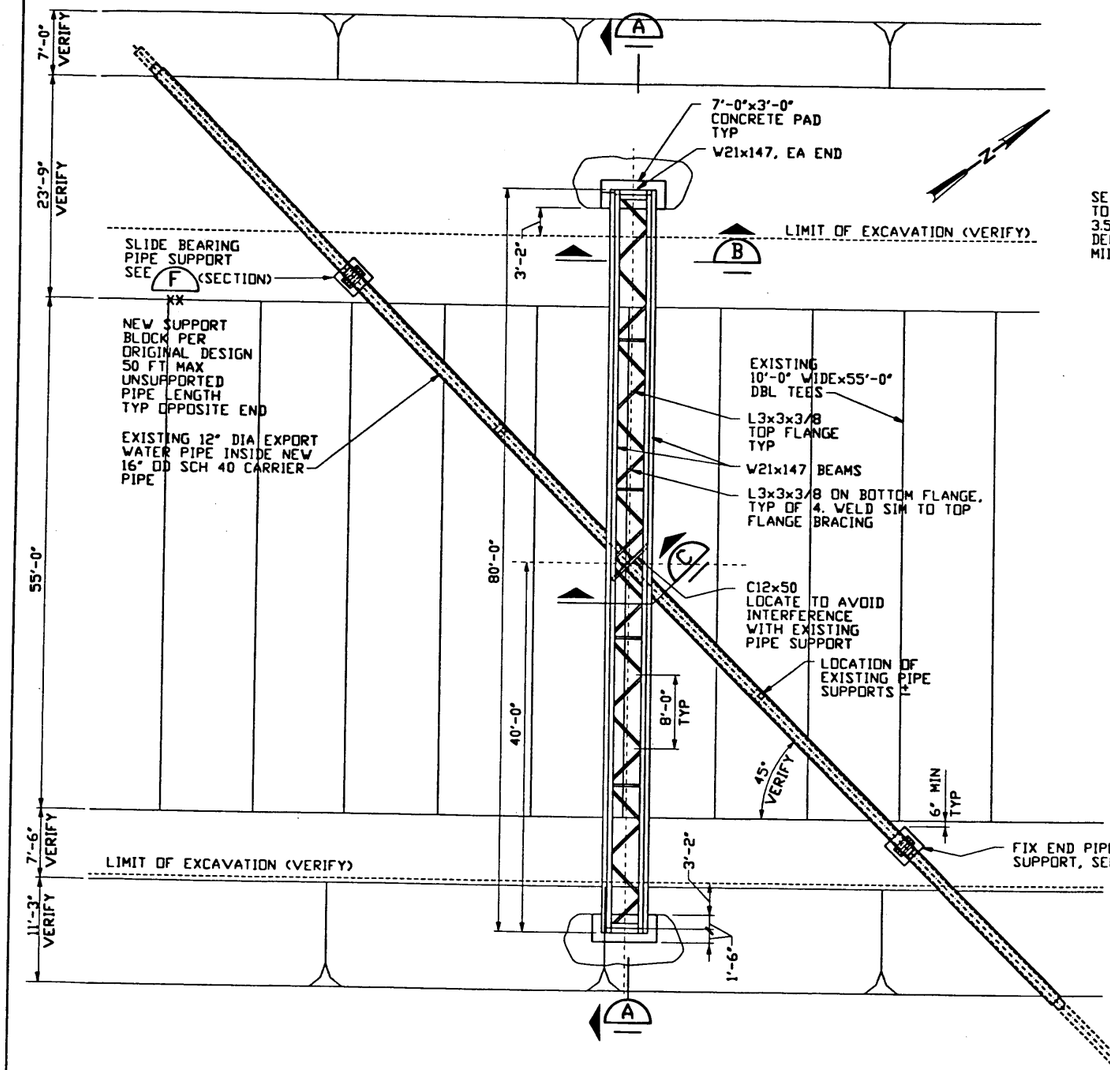
SECTION G
3"=1'-0"

CARRIER PIPE NOTES:

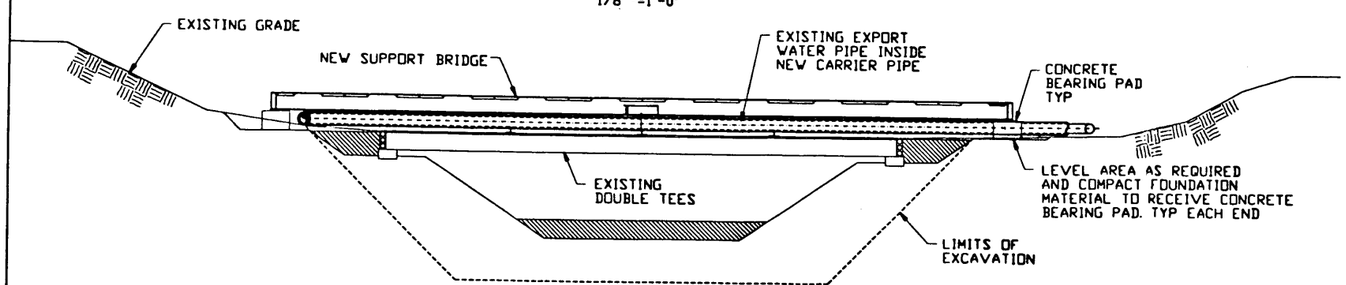
1. CARRIER PIPE TO BE ASTM A106, GRADE B (SEAMLESS) OR ASTM A53, GRADE B, TYPE S (SEAMLESS).
2. CIRCUMFERENTIAL AND LONGITUDINAL WELDS TO BE PREQUALIFIED PER AWS D1.1-98, SECTION 3 (NO OPEN ROOT WELDING PERMITTED).
3. STEEL BACKING TO MEET CODE PARAGRAPH 5.10.3 (i.e. 3/16 " FOR SMAW, 1/4 " FOR FCAW-S & 3/8 " FOR FC
4. CONTRACTOR TO PROVIDE FULL TIME CERTIFIED WELDING INSPECTOR (CWI) PER CODE. CWI WILL PERFORM 100% VISUAL INSPECTION OF ALL WELDING PER AWS D1.1, 6.9 VISUAL INSPECTION AND TABLE 6.1 FOR TUBULAR CONNECTIONS.
5. CONTRACTOR TO PROVIDE WRITTEN WELDING PROCEDURE SPECIFICATIONS (WPS's) AND WELDER PERFORMANCE QUALIFICATION RECORDS (WPQR's) PRIOR TO ANY WELDING PER CODE.

DRAFT

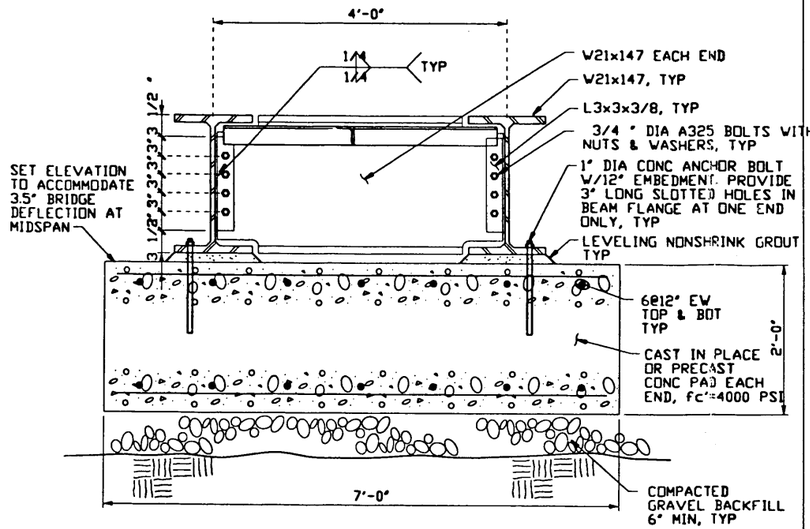
Export Water Pipe Support Details



PLAN
1/8 "=1'-0"



SECTION A
1/8 "=1'-0"



SECTION B
1"=1'-0"

NOTES:

1. CONTRACTOR SHALL VERIFY LOCATION AND RELATIVE ELEVATION OF EXISITNG DOUBLE-TEES, EXPORT WATER PIPE, AND GROUND SURFACE AT LOCATION OF PIPE SUPPORT BRIDGE ABUTMENTS. SET TOP ELEVATION OF ABUTMENTS TO PROVIDE ADEQUATE CLEARNCE TO TOP OF EXISTING DOUBLE-TEES, TAKING INTO ACCOUNT A 3.5 INCHES BRIDGE DEFLECTION AT MIDSPAN.
2. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE UNIFORM BUILDING CODE (UBC) AND OTHER CODES AND STANDARDS LISTED BELOW, LATEST EDITION.
3. DESIGN LOADS:

   BEAMS DEAD LOAD = 147 LBS/FT

   12" DIA SCH 40 EXPORT WATER PIPE = 55.3 LBS/FT

   WATER IN EXPORT WATER PIPE = 48.5 LBS/FT

   16" DIA SCH 40 CARRIER PIPE = 85.5 LBS/FT

   WIND UBC 80 MPH, EXPOSURE C

   UBC SEISMIC ZONE 2B, SOIL PROFILE SE, Ip = 1.50

4. CONCRETE:

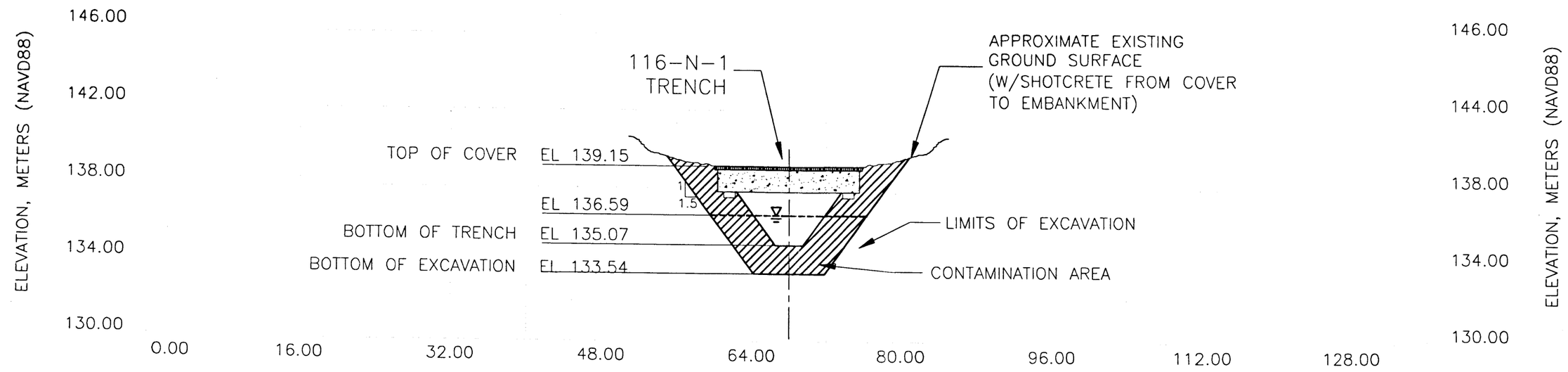
   fc' = 4000 PSI AT 28 DAYS

5. REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60. PROVIDE 3" CLEARANCE TO BOTTOM FACE AND 2" CLEARANCE AT ALL OTHER FACES OF CONCRETE.
6. COMPACTED GRAVEL SHALL BE WELL GRADED CRUSHED ROCK, WETTED AND COMPACTED IN 6 INCH LIFTS WITH 2 PASSES (MIN) OF A VIBRATORY-TYPE OR RAMMER-TYPE COMPACTOR.
7. ALL STRUCTURAL STEEL PLATES AND SHAPES SHALL CONFORM TO ASTM A36. MACHINE BOLTS SHALL CONFORM TO ASTM A325.
8. ALL WELDING SHALL BE IN ACCORDANCE WITH ANSI/AWS D1.1, STRUCTURAL WELDING CODE - STEEL. A CERTIFIED WELDING INSPECTOR SHALL PROVIDE 100 VISUAL INSPECTION ON COMPLETE JOINT PENETRATION WELDS AND FILLET WELDS. SUBMIT COMPLETE CODE REQUIRED FORMS FOR WELDING PROCEDURE SPECIFICATIONS (WPS) AND WELDING PERFORMANCE QUALIFICATIONS (WPQ).

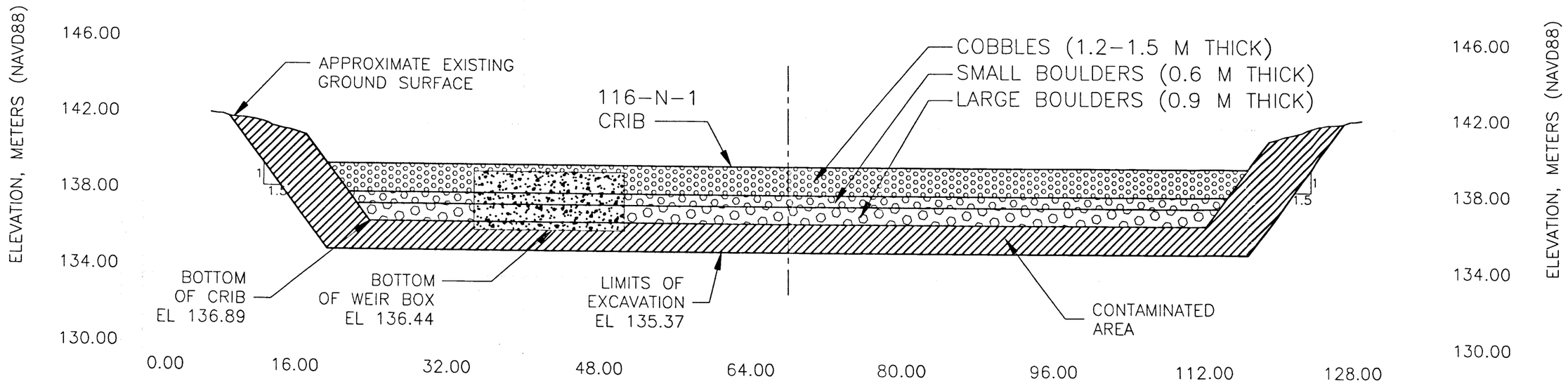
DRAFT

Export Water Pipe Support
Plan and Section

1N:102199a



NOTE: ALL ELEVATIONS MUST BE FIELD VERIFIED
VERTICAL SCALE EXAGGERATION: 2X



LONGITUDINAL SECTION OF CRIB

Attachment 8

U.S. DEPARTMENT OF ENERGY DOE FIELD OFFICE, RICHLAND HANFORD ENVIRONMENTAL RESTORATION PROGRAM	TYPICAL CROSS SECTION 116–N–1 CRIB AND TRENCH